ROHDE&SCHWARZ

Service manual

LOGIC GENERATOR IGA

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3. Maintenance

3.1 Required Measuring Equipment and Accessories

No.	o Instrument type, required specifications • Recommended R&S instrument	Type	Order No.	Section
1	o Oscilloscope, two channels, 50 MHz			Complete section 3
2	o Function generator, output for TTL level, 1 MHz, minimum pulse with adjustable 20 ns			3.6.5 3.7 3.8
3	o Pulse counter, 2 MHz, TTL level			3.11
4	o TTL load 10 TTL standard loads			3.4 3.5

3.2 General Information on Time Measurements

In the following sections, various timings given in the specifications are checked. Under the conditions determined by the test setup, the measurement starts or ends at the moment at which the input or output voltage (falling or rising) passes through a given threshold.

This level is 1.5 V for a transition from one TTL level to the other.

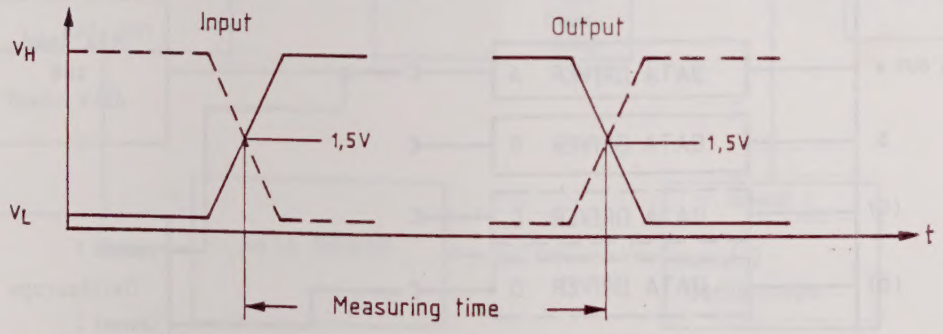
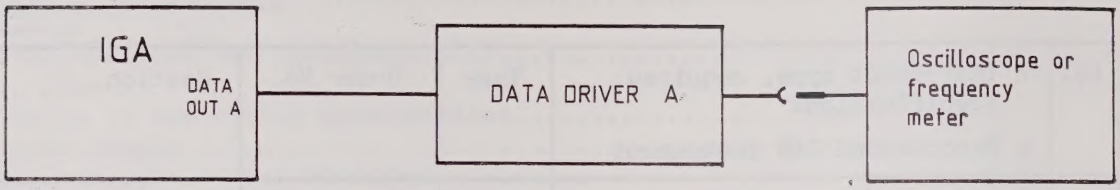


Fig. 3-1 Definition of thresholds for timing specifications

3.3 Checking the CLOCK MODE INTERN.

Test setup:



a) Data entry:

	IGA 03	IGA 02
- Create the module.		
- Select the format as follows:	8 H	8 H
- Data line 1Ø: enter ØØ		
- Data line 2Ø: enter FF		

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter a frequency of 1.7 MHz.

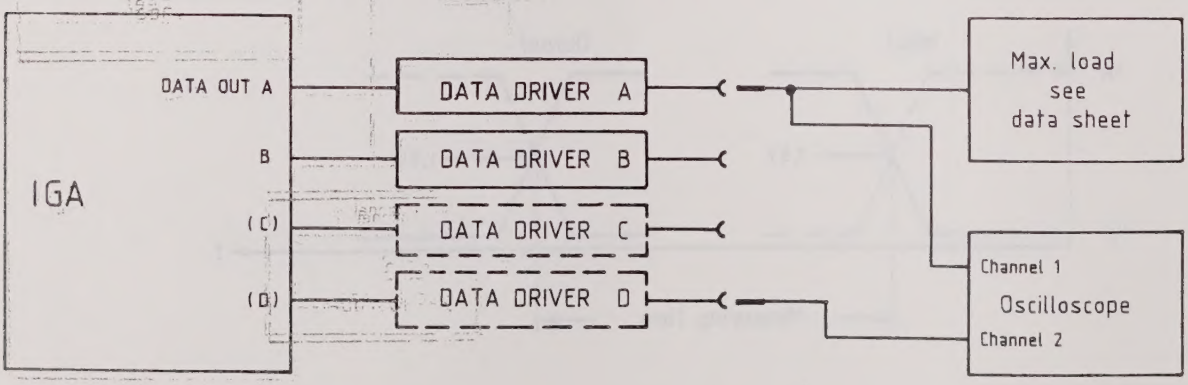
e) Start the entered module.

f) The outputs of data driver A deliver a periodical squarewave signal whose frequency is exactly half the value set above. Use the oscilloscope for checking or, in the case of precise measurements, the frequency meter.

g) Repeat d) to f) using the frequencies of 720 kHz, 500 kHz, 250 kHz, 100 kHz, 10 kHz, 1.0 kHz, 100 Hz, 10 Hz, 1 Hz and 0.2 Hz.

3.4 Checking the Data Drivers

Test setup:



a) Data entry:

	IGA Ø3	IGA Ø2
- Create the module.		
- Select the format as follows:	32 H	16 H
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	FFFFFFFF	FFFF

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter the desired frequency (e.g. 1 MHz).

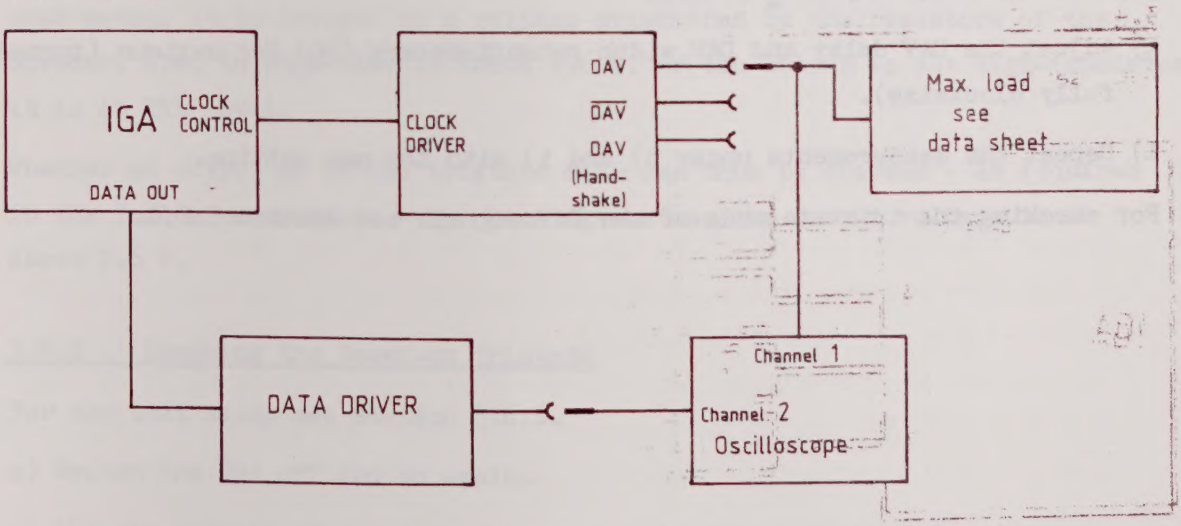
e) Start the entered module.

f) A periodical squarewave signal appears at the outputs of all the data drivers. Connect the maximum permissible load to all the data outputs either consecutively or simultaneously and check on an oscilloscope whether the values specified for low and high levels, rise and fall times are observed.

g) In general, all the data outputs do not switch over exactly at the same time. The difference in time (skew) between the switchover of the individual data lines of a data driver and all the data lines of the device can be checked with the aid of a dual-trace oscilloscope.

3.5 Checking the DAV Outputs

Test setup:



a) Data entry:

	IGA Ø3	IGA Ø2
- Create the module.		
- Select the format as follows:	32 H	16 H
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	FFFFFFFF	FFFF

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter the desired frequency (e.g. 1 MHz).

e) Adjust the DAV delay and DAV width potentiometers (40) for minimum (turned fully anticlockwise).

f) Start the entered module.

g) Connect the maximum permissible load to all the DAV, $\overline{\text{DAV}}$ and DAV-handshake outputs either consecutively or simultaneously and check on an oscilloscope whether the values specified for low and high levels, rise and fall times are observed.

h) The DAV signal must appear always after a data change. Check with the dual-trace oscilloscope whether all the 3 DAV signals appear after a data change at the times given in the specifications.

i) Check whether the minimum duration of the DAV signal is observed.

j) Select a frequency of $\leq$ 50 kHz.

k) Adjust the DAV delay and DAV width potentiometers (40) for maximum (turned fully clockwise).

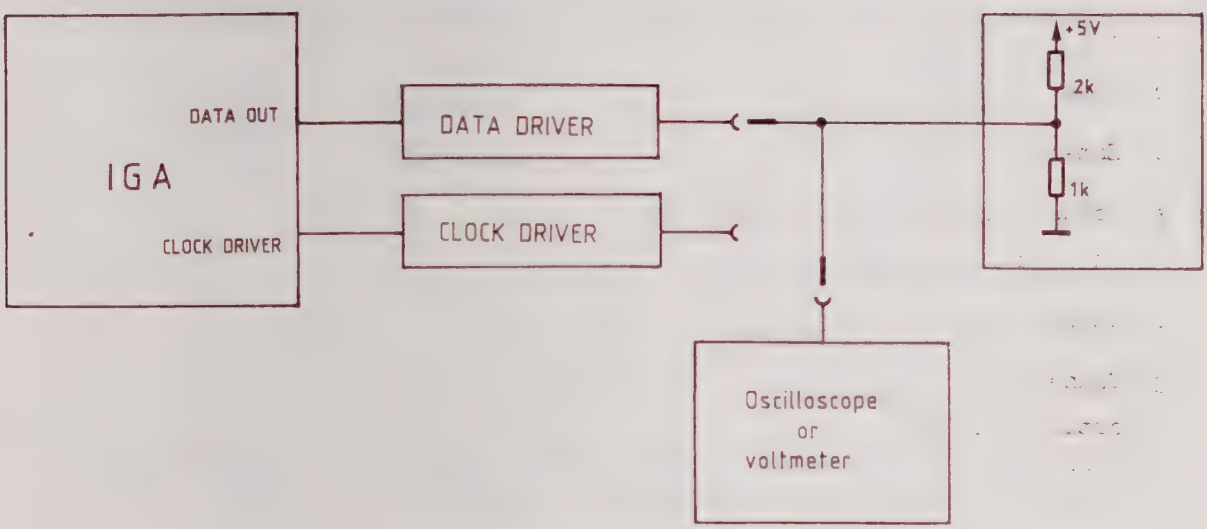
l) Repeat the measurements under h) and i) with the new setting.

For checking the tristate mode of the DAV signals see section 3.6.4.

3.6 Checking the Tristate Mode

3.6.1 General

Test setup:



An output must be loaded for checking whether it is in the tristate mode. If a high-impedance output is connected to the voltage divider included in the test setup, it is brought to a voltage determined by the resistors of the divider, i.e. in this case to about 1.6 V. If the output is not high-impedance, it is at TTL level.

Whether an output is in the tristate mode can thus be checked - as required in the following sections - by checking whether the output voltage is at about 1.6 V.

3.6.2 Checking the Power-on Tristate

For the test setup see section 3.6.1.

a) Switch the IGA off and on again.

b) All the outputs of the data drivers should have gone high impedance. Check in accordance with section 3.6.1.

3.6.3 Checking the End Tristate

For the test setup see section 3.6.1.

a) Data entry:

- Create the module	IGA Ø3	IGA Ø2
- Select the format as follows:	32 H	16 H
- High Z: enter	ABCD	AB
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	ØØØØØØØØ	ØØØØ

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE SINGLE (20).

d) Enter the desired frequency.

e) Start the entered module.

f) After the last data word has been output, all the data outputs go high impedance. Check in accordance with section 3.6.1.

3.6.4 Checking the Line Tristate and the DAV Tristate

For the test setup see section 3.6.1.

a) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	3 b 24 H	1 b 12 H
- Data line 1Ø: enter	ØØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	.....	....
- Data line 3Ø: enter	111FFFFFF	1FFF
- Data line 4Ø: enter	.....	....

During data entry for lines 2Ø and 4Ø, press the L key once for each line. A short bar appears in the upper righthand section of the display to the right of the line number indicating that in this line the DAV output goes high impedance. It should be noted here that data lines D3 to D7 of data driver D (IGA Ø3) and D5 to D7 of data driver B (IGA Ø2) are not available for data input and output since they are used for the tristate mode.

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter the desired frequency.

e) Start the entered module.

f) Load all the data outputs consecutively in accordance with section 3.6.1. The waveform shown in Fig. 3-2 appears at all the data outputs except for the outputs D3 to D7 of data driver D (IGA Ø3) and D5 go D7 of data driver B (IGA Ø2). (Every second data word is high impedance). Check in accordance with section 3.6.1.

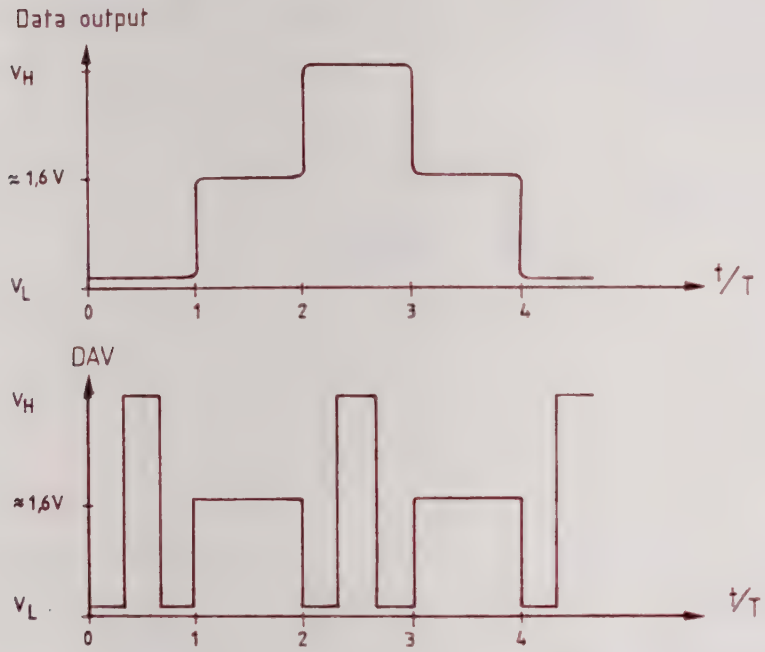
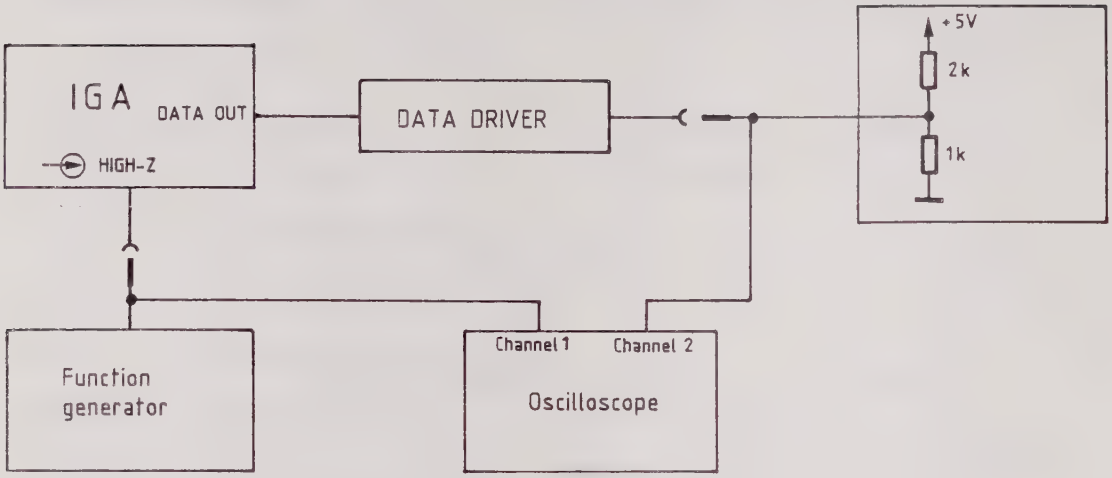


Fig. 3-2 Waveforms at the loaded data and DAV outputs

g) Load the DAV, $\overline{\text{DAV}}$ and DAV-handshake outputs consecutively in accordance with section 3.6.1. They go high impedance at the same time as the data outputs. Check in accordance with section 3.6.1.

3.6.5 Checking the External Tristate Mode (HIGH-Z (40))

Test setup:



a) Data entry:

	IGA Ø3	IGA Ø2
- Create the module.		
- Select the format as follows:	32 H	16 H
- HIGH-Z: enter	ABCD	AB
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	ØØØØØØØØ	ØØØØ

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter the desired frequency.

e) Set the POLARITY LOGIC switch (37) to POS.

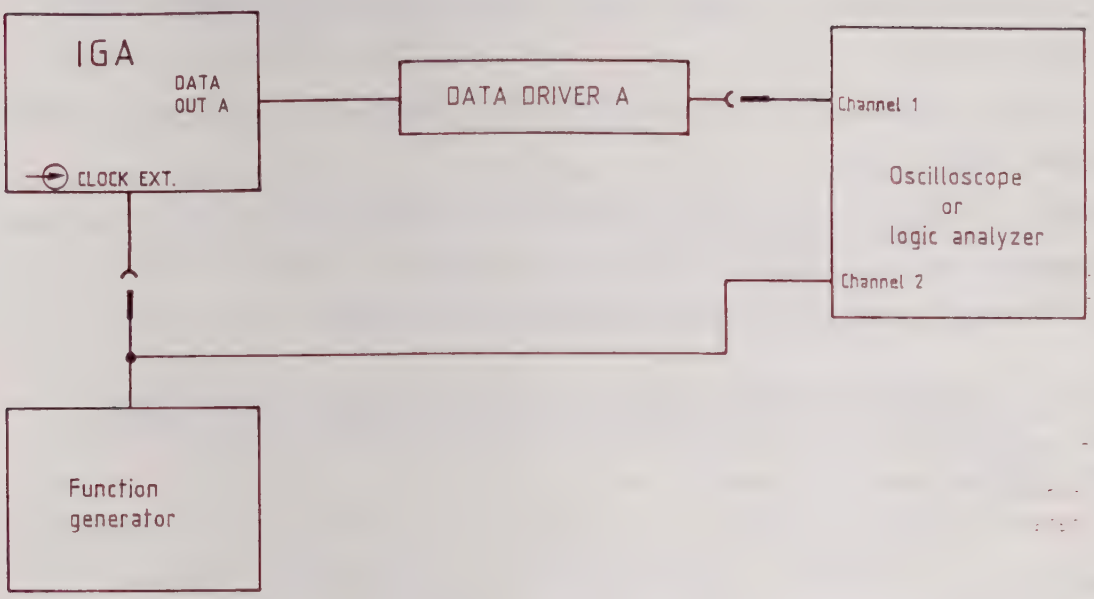
f) Start the entered module.

g) Set the function generator as follows: squarewave signal,
500 kHz,
mark-to-space ratio 1:1,
TTL level

h) A high level at the input HIGH-Z (40) causes all the data outputs to go high impedance. The levels at the outputs alternate between low and tristate (1.6 V) at a clock rate of 500 kHz. Check in accordance with section 3.6.1.

3.7 Checking the CLOCK MODE EXTERN.

Test setup:



a) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	8 H	8 H
- Data line 1Ø: enter ØØ.		
- Data line 2Ø: enter FF.		

b) Switch to CLOCK MODE EXTERN. (18).

c) Set the POLARITY CLOCK EXT. switch (37) for the positive-going edge.

d) Select CYCLE MODE REPEAT (20).

e) Set the function generator as follows: squarewave signal,
1.7 MHz,
mark-to-space 1:1,
TTL level.

f) Start the entered module.

g) The outputs of data driver A deliver a periodical squarewave signal whose frequency is exactly half the value of the frequency applied to the function generator. Check on the oscilloscope.

h) Referred to the selected active clock edge, the data appear delayed at the output. Check with the oscilloscope or the logic analyzer whether the delay is within the time interval given in the specifications.

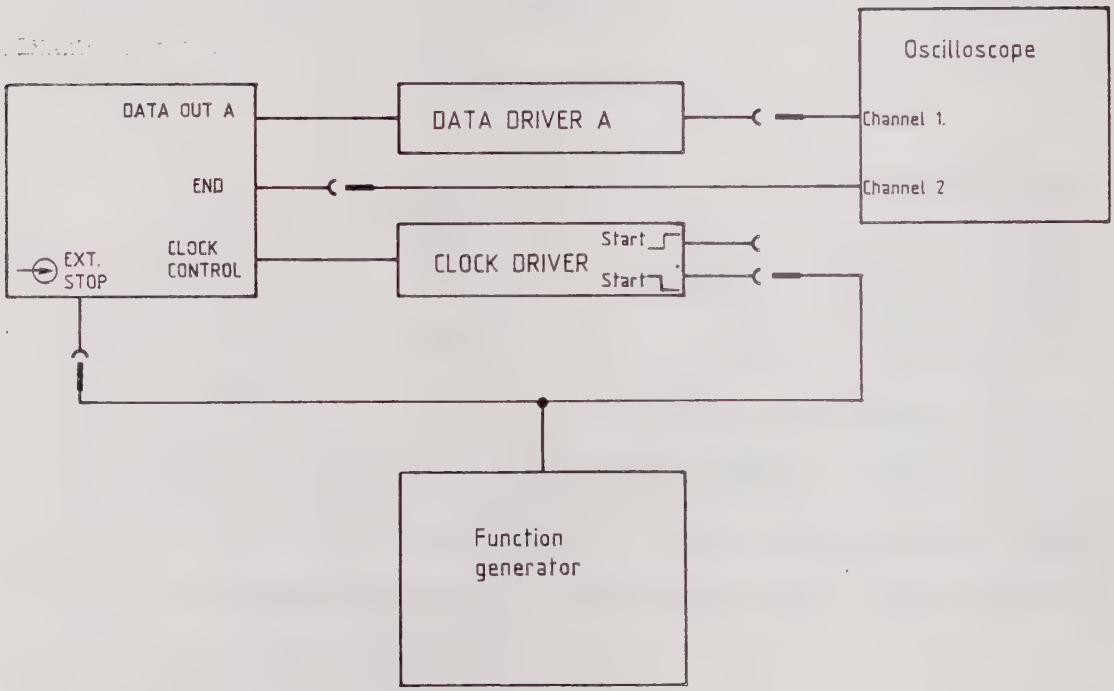
i) Vary the mark-to-space ratio of the input signal such that the duration of the high level corresponds to the minimum pulse width for clock ext. given in the specifications. Check whether the data output continues to be satisfactory.

j) Stop the output and set the POLARITY CLOCK EXT. switch (37) to the negative-going edge.

k) Repeat steps e) to h). For checking in accordance with h), vary the mark-to-space ratio of the input signal such that the duration of the low level corresponds to the minimum permissible pulse width.

3.8 Checking the External Start, External Stop and the END Output

Test setup:



Note: Connect the function generator to that start input of the clock driver whose active edge is negative-going.

a) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	8 H	8 H

- Data line 1Ø: enter ØØ.
- Data line 2Ø: enter FF.

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Enter a frequency of 1 MHz.

e) Set the function generator as follows: squarewave signal,
1 Hz,
mark-to-space ratio 1:1,
TTL level.

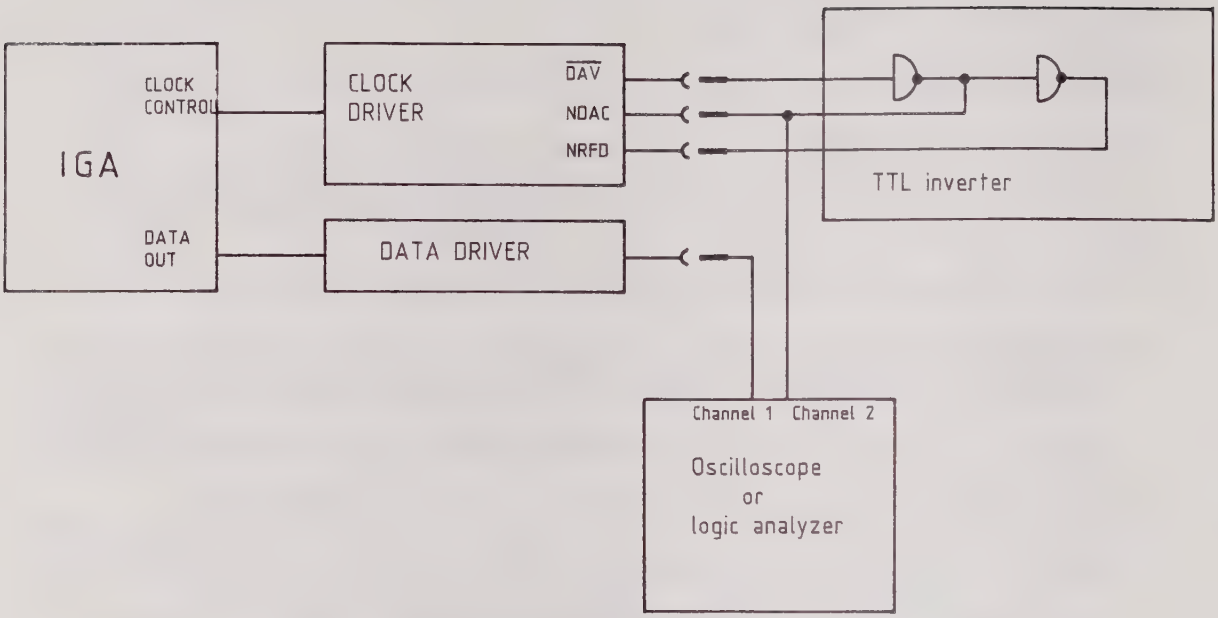
f) Set the POLARITY STOP switch (37) for the positive-going edge.

g) Alternately start and stop the IGA by the squarewave signal at a clock rate of 1 Hz. This can be observed by connecting an oscilloscope to the output of data driver A; the 1-MHz signal appears and disappears alternately. Stopping the IGA can be observed at the END output (42).
If the positive-going edge of the end signal is selected with the POLARITY END switch (37) as the active edge, a high level appears while the IGA is in the idle state; with the negative-going edge selected, a low level appears.

h) Set the POLARITY STOP switch (37) for the negative-going edge, connect the output of the function generator to the other start input of clock driver A (the active edge now being positive-going) and repeat the check-out as under g).

3.9 Checking the 3-wire Handshake

Test setup:



Note: Data output in the handshake mode requires a listener which delivers the signals NDAC and NRFD.
For measuring the maximum output frequency in the handshake mode, this listener is simulated by two TTL inverters (dummy listener) in the above test setup.
Any other listener of equal speed can be used.

a) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	32 H	16 H
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	FFFFFFFF	FFFF

b) Switch to CLOCK HANDSHAKE MODE 3-WIRE (18).

c) Select CYCLE MODE REPEAT (20).

d) Until the start is made, a DAV signal must not be output, i.e. the $\overline{\text{DAV}}$ and the handshake-DAV outputs are at high level, the DAV output is low. Use an oscilloscope for checking.

e) Start the entered module.

f) In the 3-wire handshake mode, the IGA outputs its data with its maximum speed. Use an oscilloscope or a logic analyzer to check whether the timing of the data and the signals DAV, NDAC and NRFD conforms to that given in Fig. 2-6 (appendix). In particular, it can be checked whether the maximum data rate (e.g. to be found from the time difference between two successive NDAC signals) corresponds to that given in the specifications.

3.10 Checking the 2-wire Handshake

The 2-wire handshake mode is checked in the same way and with the same test setup as the 3-wire handshake with the following exceptions:

- The NRFD line need not be connected to the dummy listener (see test setup).
- Under c) of the instructions given in section 3.9, the 2-wire handshake mode has to be selected instead of the 3-wire handshake mode.

3.11 Checking the Number of Data Words Output

Test setup:

a) Data entry:
   - Create the module.
   - Select the format 1 b.
   - Alternately enter Ø and 1 for each data line until the desired module length is obtained.

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE SINGLE (20).

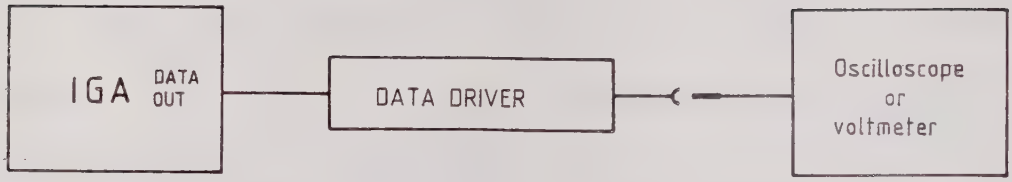
d) Select the desired frequency.

e) Start the entered module.

f) Check whether the pulse number indicated by the pulse counter corresponds to that output by the IGA.

3.12 Checking the Logic Switchover

Test setup:



a) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	32 H	16 H
- High-Z: enter	ABCD	AB
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	ØØØØØØØØ	ØØØØ

b) Switch to CLOCK MODE INTERN. (18).

c) Select CYCLE MODE REPEAT (20).

d) Select any frequency.

e) Set the POLARITY LOGIC switch (37) to POS.

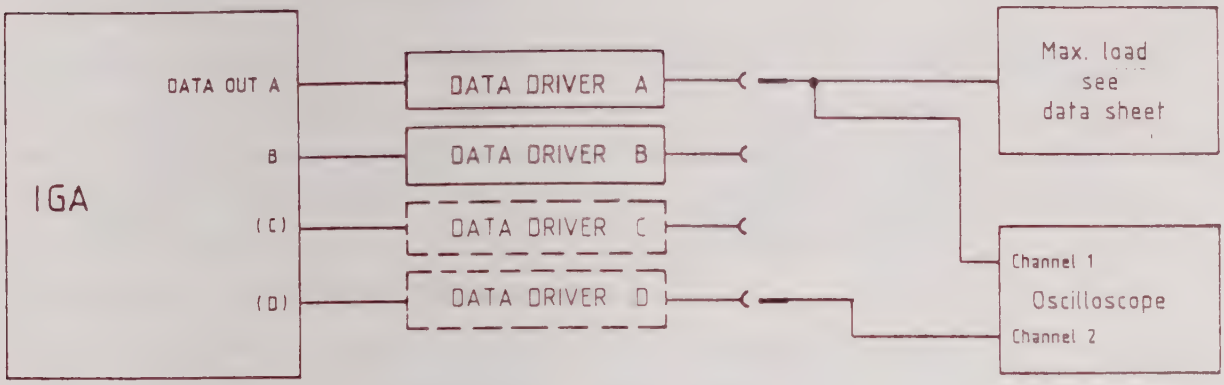
f) Start the entered module.

g) Check with an oscilloscope or voltmeter whether all the data outputs have low level.

h) Stop the output (STOP, 17); set the POLARITY LOGIC switch (37) to NEG; start the IGA again and check whether all the data outputs have now high level.

3.13 Checking the High-level Setting Range of the General-purpose Drivers

Test setup:



The connected load must be able to handle input voltages of +15 V.

a) Turn the VAR LEVEL potentiometer (36) fully anticlockwise.

b) Data entry:

- Create the module.	IGA Ø3	IGA Ø2
- Select the format as follows:	32 H	16 H
- Data line 1Ø: enter	ØØØØØØØØ	ØØØØ
- Data line 2Ø: enter	FFFFFFFF	FFFF

c) Switch to CLOCK MODE INTERN. (18).

d) Select CYCLE MODE REPEAT (20).
Enter the desired frequency (e.g. 1 MHz).

e) Start the entered module.

f) The high level must not exceed the maximum value of +3 V.

g) Turn the VAR LEVEL potentiometer clockwise and observe the output signal on the oscilloscope. It must be possible to set a high level of at least +15 V.

4. Circuit Description

4.1 General

(See circuit diagram 344.0015.01 S)

The IGA is a microprocessor-controlled instrument. The operation, display and data management are monitored and controlled by the CPU (central processing unit). However, every bit pattern output is organized by a hardware logic, the sequence control. The microcomputer only performs the initialization and is able to start and stop the output. The following description deals to a large extent only with the hardware.

Fig. 4-1 shows the functional groups of the instrument. The squares represent circuit boards which are plugged into each other.

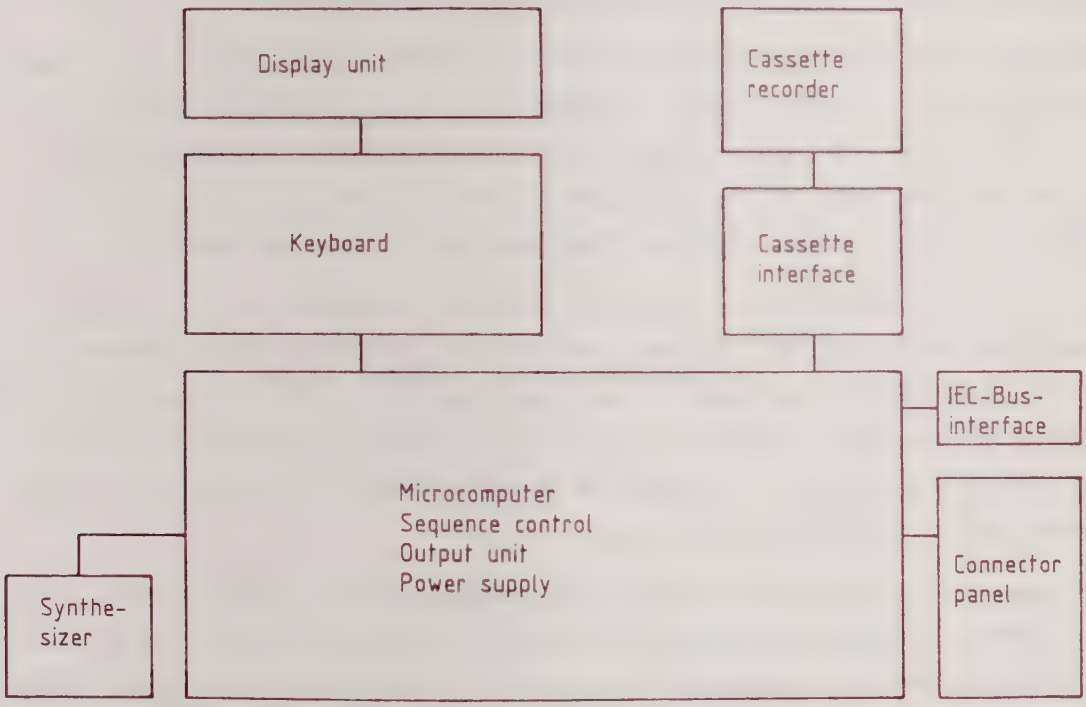


Fig. 4-1 Functional groups of IGA

The heart of the IGA is the microcomputer. Together with the sequence control, output unit and power supply it is accommodated on the motherboard. The CPU receives its clock from the synthesizer board where also the output clock is generated. The display unit and the keyboard permit manual operation of the

instrument, the IEC-bus interface board (IGA-B1) enables remote control in accordance with the IEC standard. The bit patterns entered are stored in the memory of the output unit. They are applied via the connector panel to the data drivers with the aid of the sequence control. The connector panel also feeds the clock drivers and the BNC female connectors on the rear panel and signals the positions of the slide switches to the sequence control and the computer. The cassette recorder and cassette interface (IGA-B2) permit the bit patterns and some associated instrument settings to be written onto a mini-cassette and entered from there.

4.2 Microcomputer

(See circuit diagram 344.0450 S)

The microcomputer included in the IGA essentially consists of the CPU (D50), ROMs (D60 to D64), RAMs (D90, D91, D70) and I/O ports (D70).

The heart of the computer is the microprocessor 8085A. It uses an 8-bit data bus and is able to handle 16-bit addresses. In multiplexed operation, pins AD0 to AD7 of the CPU handle either data or the 8 low-order address bits. With the trailing edge of the ALE signal, the addresses are transferred to register D31 whose outputs deliver the lower half of the address bits.

Transceivers D32 and D33 are connected into the data bus. Due to the gate linkage applied to pin 19, the two transceivers leave the high-impedance state only if the processor performs a read operation ($\overline{RD}$ or $\overline{INTA}$ is low) or a write operation ($\overline{WR}$ is low). The level at pin 1 determines the direction in which the transceivers operate. (If the ROMs or RAMs D90, D91, D70 are read, D33 operates in the righthand direction).

The program and the fixed data of the microcomputer are stored in five ROMs (D60 to D64). They are selected by the address decoder D34 and read by $\overline{RD}$. The available storage capacity is 20 Kbytes. Variable data and return addresses are saved in the RAM area of D70 or in the CMOS RAMs (D90, D91). In this case, the available storage capacity is 256 + 1 Kbytes. D90 and D91 are selected via pin 2, the RAM area of D70 via pin 1 of the decoder D35.

When the IGA is disconnected from the AC supply, the contents of the CMOS RAMs are not lost. The power supply brings D41II.5 low (chip enable power fail), thus inhibiting the RAMs. The storage cells included in the set deliver the supply voltage required for retaining the data. D70 is directly connected to the time-multiplexed bus (AD0 to AD7) of the microprocessor. The ALE signal is required for the internal address latch. The input/output area of

D70 can be addressed via D35.8. It is used to drive the LEDs on the keyboard and to poll for instance the position of the switches on the connector panel and on the IEC-bus interface (only if option IGA-B1 is fitted). The timer of D70 (input: pin 3; output: pin 6) is connected into the PLL of the synthesizer and helps to set the synthesizer clock depending on the programmed division ratio.

The microcomputer exchanges data and control information with the other functional groups of the IGA. This is done mainly by read and write cycles via the data bus in addition to the exchange via the I/O area of D70. Using the remaining $\overline{CS}$ outputs of decoder D35 and part of the address lines, the corresponding ICs are selected (memory-mapped I/O). Fig. 4-2 shows the configuration of the address area. Data are transferred from and to the cassette recorder (only with option IGA-B2 fitted) via the serial SID and SOD pins of the CPU.

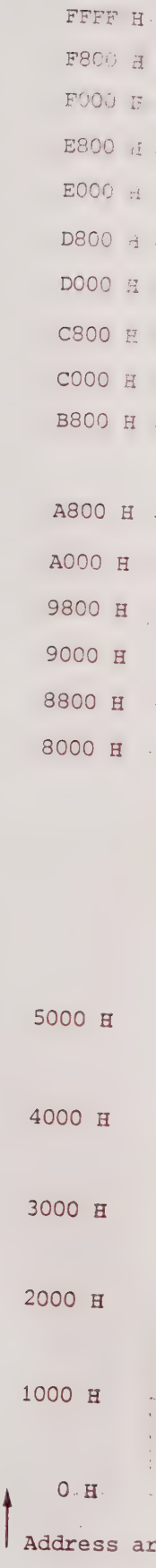
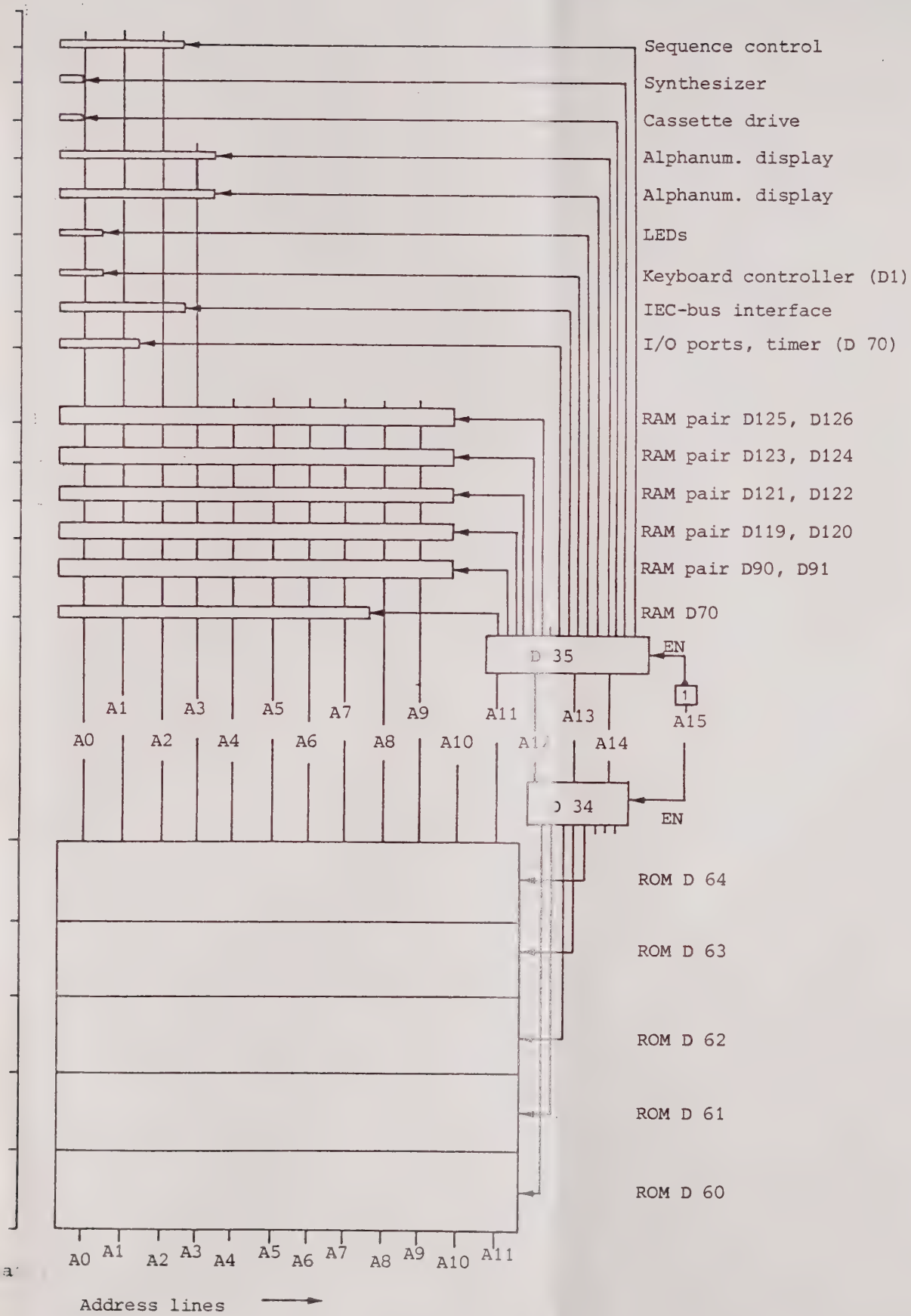

FFFF H
F800 H
F000 H
E800 H
E000 H
D800 H
D000 H
C800 H
C000 H
B800 H
A800 H
A000 H
9800 H
9000 H
8800 H
8000 H
5000 H
4000 H
3000 H
2000 H
1000 H
0 H
Address ar

Fig. 4-2 Co



figuration of the address area

Interrupt requests enable the hardware to influence directly the program sequence:

Every keystroke is signalled to INTR (D50.10) and the microcomputer reads in the key code. RST 5.5 (D50.9) is used for the IEC bus (only if option IGA-B1 is fitted). RST 6.5 (D50.8) comes from the cassette interface and causes the CPU to read a bit in via the SID input (D50.5) (only if option IGA-B2 is fitted). The sequence control signals, by way of RST 7.5 (D50.7), the stop and external start of a bit pattern output. The microcomputer switches the LEDs on the keyboard and enables the start input. A power-fail signal at the TRAP input (D50.6) starts a rescue routine bringing the data and the hardware to a defined state.

Additional elements are provided on the microcomputer of the IGA to perform the signature analysis (see section 5). The first part of this test method includes a performance check of the processor and checks the data and the address bus as well as the contents of the program memories.

For this purpose, links X35B and X30B are inserted such that pins 1 and 2 are connected. Thus transceivers D32, D33 are switched to high impedance, i.e. the microcomputer is isolated from the system data bus. After the CPU has been reset by shortcircuiting X33, the first opcode fetch is executed at the address 0. With a low level on $\overline{RD}$, driver D30 is activated and the processor reads in the NOP instruction (all the data lines are low). Next it increments the address and repeats the read operation. In this way, the complete address area is covered, all the chips are addressed and read out as far as possible. In particular, the complete ROM contents can be observed on the data bus between D32 and D33. Since only ROMs are located in the address area A15 = low, the level on the highest address line is suitable for use as the start and stop signal for a signature analyzer (see section 5).

Special service routines can be started to perform additional test steps via links X41B, X42B and X43B.

4.3 Keyboard

(See circuit diagram 344.0438 S)

The programmable keyboard/display interface chip D1 cyclically checks the status of the individual keys and stores every stroke in an internal RAM. Moreover, in multiplexed operation, it applies the data from the display RAM to the seven-segment indicators of the display unit.

D1 is selected via pin 22 of the address decoder D35 in the microcomputer (see Fig. 4-2). If the address line A0 (D1.21) is high, the chip expects instructions from the data bus.

With A0 set low, the microcomputer can fetch the stored key code and write into or read the display RAM.

D1 is used in the encoded mode. For this reason, a binary counter signal appears at the outputs S0 to S3. The scan frequency is thus produced by dividing the input clock applied to pin 3.

Each keystroke is recognized by one of the sensor lines R0 to R7 and a key code consisting of the line number, column number and the level at the shift input (pin 36) is stored in D1. Next, D1 produces a CPU interrupt via pin 4.

The outputs of the scan counter (D1) S0 to S3 furnish the addresses to the display unit for multiplexed operation of the seven-segment indicators. Corresponding to the count, the contents of one of the 16 lines of the display RAM are available at pins 27 to 31.

H1 to H6 are connected via drivers D10 to the output ports of the microcomputer (D70.23 to 28).

Since only one of diodes H7 to H10 can be on at a time, driver D5 is fed by one of the two decoders in D11, the two address inputs (pins 2, 3) of the decoder being also taken to the output ports of the microcomputer. The status of the remaining LEDs depends on the contents of registers D3 and D4. The clock inputs of the registers (pin 11) are taken to the outputs of the second decoder in D11. If the $\overline{\text{ENABLE}}$ pin (pin 15) is low, the decoder outputs (pins 11, 12) are activated (otherwise high). D11.15 is connected to $\overline{\text{WR}}$, the decoder input (pin 14) to A0. Pin 13 is taken to the address decoder D35 of the microcomputer. In this way, D3 and D4 can be addressed by the microcomputer and can be read to.

The microcomputer takes the address lines A1 to A3 via the keyboard PCB to the display unit. Moreover, two $\overline{\text{CS}}$ lines for the dot-matrix displays are linked with each other and each of them separately with $\overline{\text{WR}}$.

4.4 Display Unit

(See circuit diagram 344.0415 S, sheets 1 and 2)

In multiplexed operation, one of the 16 seven-segment indicators (D31 to D46) is driven by decoder D30 and via pins X31.5 to X31.12. S0 to S3 are taken to

the scan counter, A0 to A3 and B0 to B3 to the output of the display RAM in chip D1 (keyboard).

The lines of the six dot-matrix displays are fed from RAMs D65 to D68 in multiplexed operation. The RAM addresses arrive via decoder D64 from counter D63 which is clocked by the oscillator D62I to D62IV. D60 and D61 activate the corresponding columns of the matrix displays.

The microcomputer writes information in RAMs D65 to D68 via the data bus. During this write operation, the $\overline{WE}$ pin (pin 3) is held low by $\overline{CSI}$ or $\overline{CSII}$ (the latter being the select lines of address decoder D35 on the motherboard) amd linked with $\overline{WR}$ by the OR gates D12 and D13 on the keyboard PCB. During CPU access, D62.11 goes low, D64 connects the microcomputer address bus to the RAM inputs and counter C63 is reset via pin 12.

4.5 Output Unit

(See circuit diagram 344.0450 S, sheet 3)

4.5.1 General

Fig. 4-3 shows the block diagram of the output unit. The lefthand margin of the drawing symbolizes the microcomputer interface, the lower margin the sequence control interface.

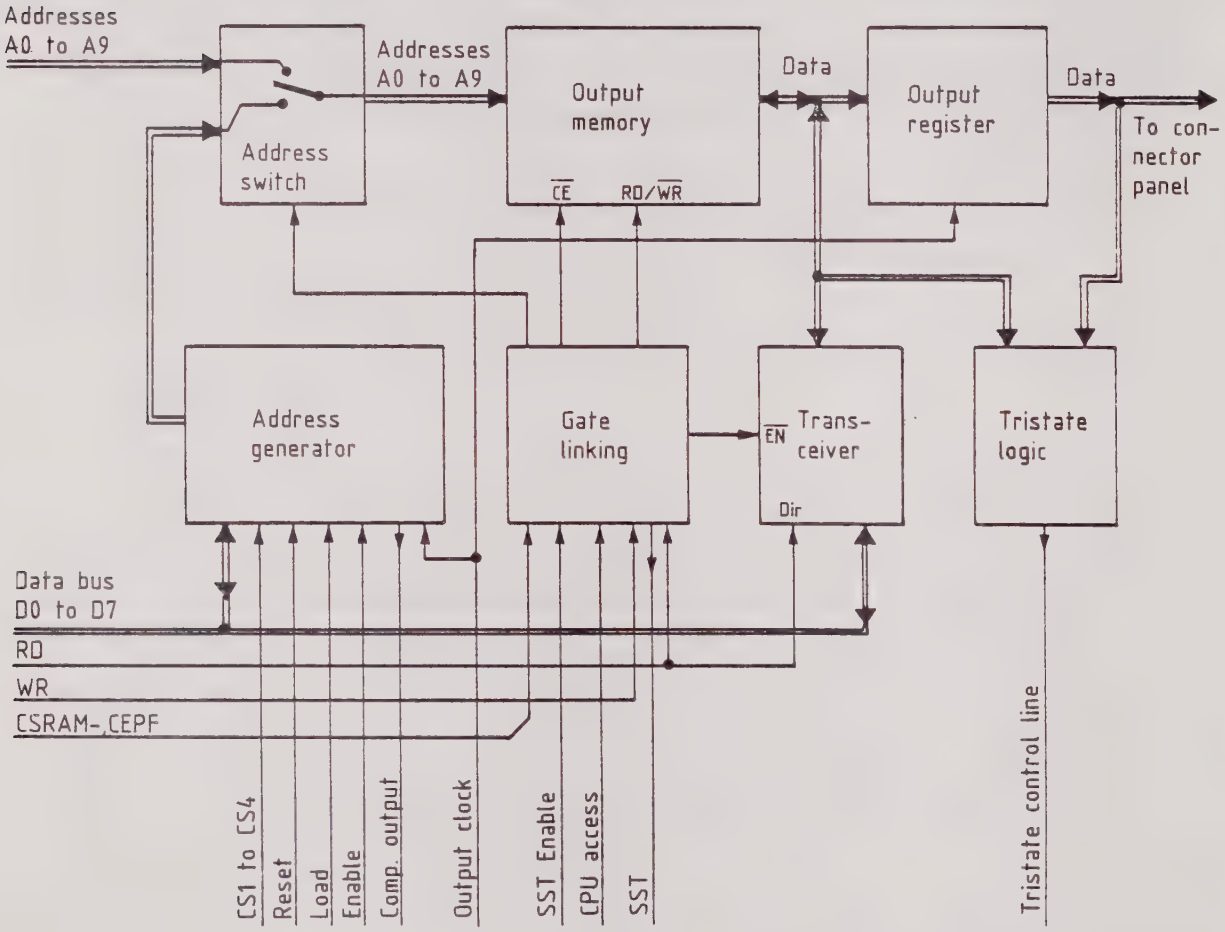


Fig. 4-3 Block diagram of output unit

The output memory which is the heart of the output unit consists of four CMOS RAMs (D123 to D126) in the case of model 02 and of eight CMOS RAMs (D119 to D126) in the case of model 03. After the IGA has been disconnected from the AC supply, these CMOS RAMs are inhibited by CEPF like the CMOS RAMs of the microcomputer and supplied from the storage cells. The RAMs are written and read by the microcomputer via transceivers D128, D130, D132 and D134 (model 02 includes only D132 and D134). The output memory receives the addresses via the address switch (D110 to D112) either from the CPU or the address generator.

The levels at the $\overline{CE}$ and RD/$\overline{WR}$ inputs of the RAMs and at the $\overline{ENABLE}$ pins of the transceivers are obtained by linking the signals on the $\overline{CSRAM..}$, $\overline{RD}$, $\overline{WR}$, $\overline{CPU\ access}$, SST $\overline{ENABLE}$ and CEPF lines. In this way, the control signal for the address switch is also obtained. Three different modes are possible:

- writing and reading of the output memory by the CPU
- non-single-step output and
- single-step output (SST).

Table 4-1 shows how the output RAMs are controlled by the gate combination.

Table 4-1 Control of output RAMs

	Addresses	RAM inputs	
		Enable ($\overline{CE}$)	RD/$\overline{WR}$
Writing and reading by the CPU	from CPU	by $\overline{CSRAM...}$	from CPU
Non-SST output	from address generator	all RAMs enabled	read only
SST output	from CPU	by $\overline{CSRAM...}$, with $\overline{CSRAM\ D}$ all RAMs enabled	read only

The address generator consists of three counters (D103, D104, D105), three comparators (D100, D101, D102), two registers (D106, D107) and two tristate drivers (D108, D109). The counters are connected in series, their outputs (D108.11 to 14, D109.11 to 14) are taken to the address multiplexers and to the driver and comparator inputs. By activating the $\overline{CS3}$ or $\overline{CS4}$ line, the count can be applied via the drivers to the data bus. The registers contain the end address of the module to be output, they are set by a leading edge

on the $\overline{CS1}$ or $\overline{CS2}$ line. The comparators compare the count and the end address and signal the coincidence to the sequence control.

The sequence control furnishes the output clock for transferring the data from the RAMs to the output registers D127, D129, D131 and D133 (for model 02, D127 and D129 only) and thus via the connector panel to the data drivers.

If the IGA is used in the line tristate mode, the data channels are no longer freely available since, depending on the model, four or two output lines are required for setting the tristate mode. If at least one of the four (model 03) or two (model 02) highest-order outputs of the RAM pair D126, D125 is high, D135.3 signals to the sequence control that, with the next output word, at least one data driver is to be set to high impedance. The channels concerned are signalled at the output of register D133 after the next edge of the output clock. A further data channel (bit 3 of the highest-order channel with model 03, bit 5 with model 02) is reserved for setting the DAV signal to high impedance.

4.5.2 Writing and Reading the Output Memory by the Microcomputer

The CPU brings the $\overline{\text{CPU access}}$ line low with the aid of the sequence control registers. Multiplexers D110 to D112 connect the address inputs of the RAMs to A0 to A9 of the CPU address bus. The SST $\overline{\text{ENABLE}}$ line D116.5 is high, just as D113.3 and RAM CEPF. Thus the $\overline{\text{CSRAM A...D}}$ select lines coming from the address decoder of the CPU are enabled. Without receiving $\overline{RD}$ and $\overline{WR}$ pulses from the CPU, the RAMs of the output unit are set to read and the transceivers to the data bus are set to high impedance via pin 19. The transceiver associated with the RAM pair selected by $\overline{\text{CSRAM A...D}}$ is activated by $\overline{RD}$ or $\overline{WR}$ (D113.8) being low. The polarity of RD determines the drive direction. D116.3 controls the RD/$\overline{WR}$ input of RAMs D119 to D126.

4.5.3 Non SST Output

The $\overline{\text{CPU access}}$ line is high. Thus the address multiplexers are connected to the counter outputs (D103 to D105). All the RAMs are set to RD (D116.3 high) and are thus enabled (a low signal at D113.3 activates all the $\overline{CE}$ inputs).

The data in the output memory are organized by the microcomputer such that the module to be output begins with the (RAM) start address 0. If a module or a module sequence consists of N bit pattern lines, the end address N-1 is entered into registers D106 and D107.

Fig. 4-12 (in the appendix) shows the timing of the main signals for the bit pattern output:
First the counters are in the reset status, the first output line is available at the data pins of the RAMs. With the first edge of the output clock, these data are transferred to the output registers; at the same time, the address delivered by the counter changes and thus also the data word at the RAM outputs. As soon as the counter has reached the end address, this is signalled by the comparators (via D100.6) to the sequence control.

In the repetitive mode, the counter-$\overline{\text{load}}$ line is then brought low. D103 to D105 are loaded in step with the clock, their preset inputs (pins 3 to 6) are taken to ground. As soon as the data line with the end address has been transferred to the output registers with the Nth output clock, the counters load the start address 0, the comparators disable the equal signal and the counter-$\overline{\text{load}}$ line goes high.

In the non-repetitive mode, the counters are stopped via the counter-enable line in response to the equal signal coming from the comparators.

The last data word is transferred to the output registers with the Nth clock. The last clock pulse sets the tristate flip-flop of the sequence control. In accordance with the end tristate specification, the corresponding data drivers are set to high impedance.

4.5.4 SST Output

In the SST mode, the current output word is displayed. For this purpose, the CPU addresses the desired line, selects and reads each RAM pair of the output unit separately. This is done in the following order: RAM pair D119, D120 - D121, D122 - D123, D124 - D125, D126 for model 03 or RAM pair D123, D124 - D125, D126 for model 02 as described in section 4.5.2 (see also table 4-1). However, the SST-$\overline{\text{enable}}$ line (D116.5) is now low.

For this reason, during the last read cycle CSRAM D (also at D116.4) brings D116.6 and D113.3 low. All the RAMs are enabled, i.e. the complete data line is applied to the output register inputs. This status is signalled, via the $\overline{\text{SST}}$ line (D116.6), to the sequence control which links this signal with $\overline{\text{RD}}$ and produces an output clock pulse.

4.6 Sequence Control

(See circuit diagram 344.0450 S, sheet 4)

4.6.1 General

With the CPU 8085, the cycle times of the individual instructions are too long for the microcomputer to make available or handle directly with the required speed all the control and monitoring signals necessary for the bit pattern output. This task is performed by the sequence control acting as a link between the CPU and the output unit. The sequence control

- stores the presettings referring to the desired mode in control registers,
- monitors and controls the output unit,
- delivers the necessary number of output clock and DAV pulses

and

- signals the output stop and external start to the processor.

The external pins for $\overline{\text{RFD}}$, $\overline{\text{DAC}}$, start ext, clock ext. and HZ ext are included. Fig. 4-4 shows a block diagram of the sequence control. The lines between the individual blocks symbolize functional connections, i.e. wiring or logic combinations by way of gates.

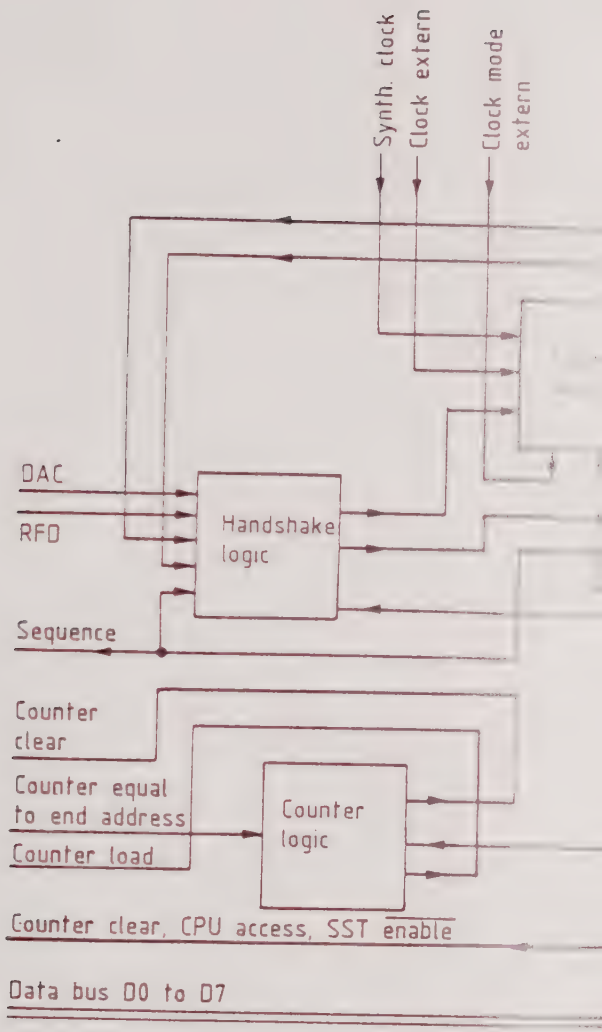
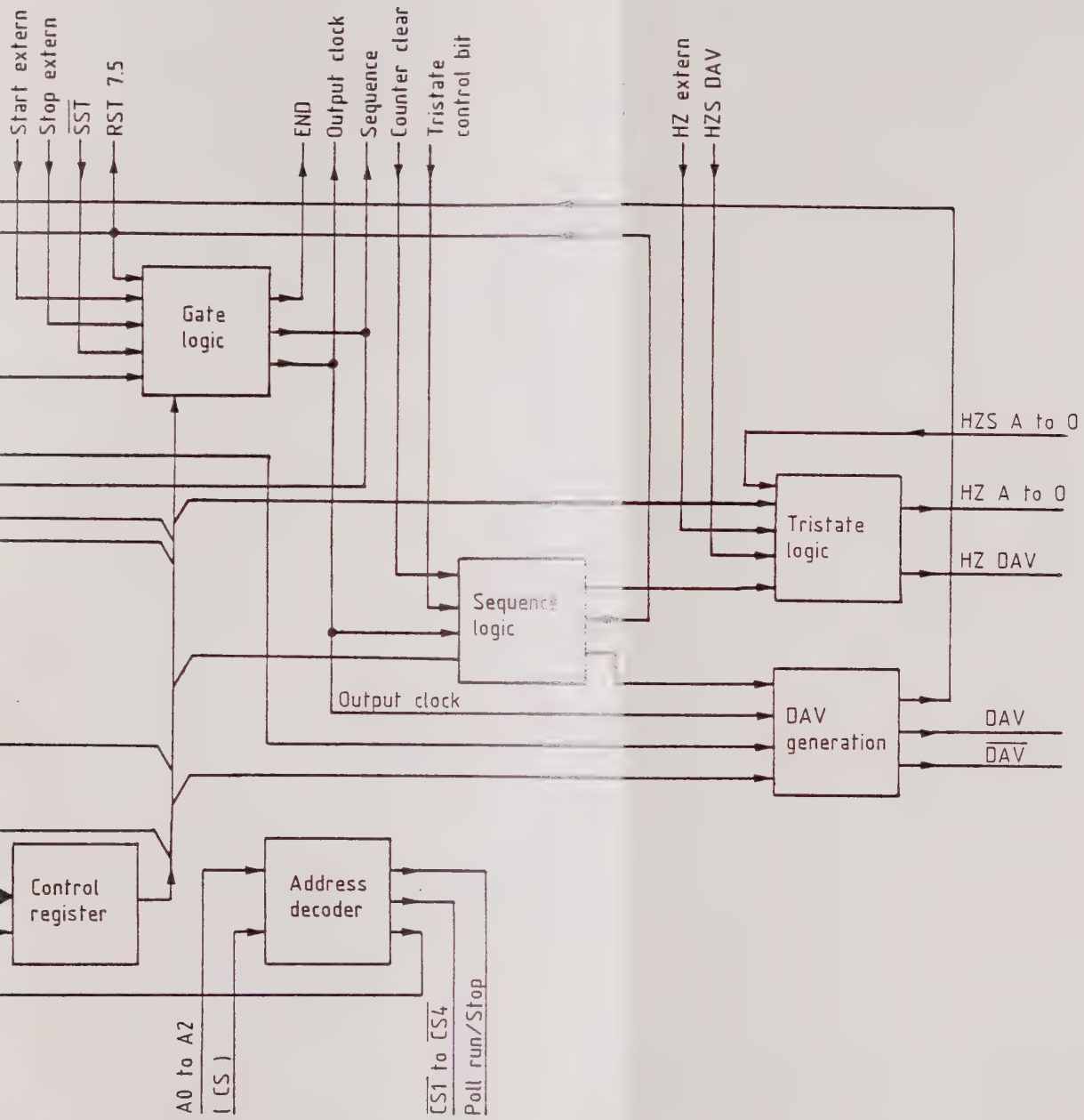


Fig. 4-4 Block diagram of sequence co


Start extern
Stop extern
SST
RST 7.5
END
Output clock
Sequence
Counter clear
Tristate control bit
HZ extern
HZS DAV
Gate logic
HZS A to 0
HZ A to 0
HZ DAV
Tristate logic
Sequence logic
Output clock
DAV generation
DAV
DAV
Control register
Address decoder
A0 to A2
(CS)
CS1 to CS4
Poll run/Stop

The address decoder of the sequence control enables the CPU access to the sequence control and the output unit. The address lines A0 to A2 and two CS lines supply the address decoder (see circuit diagram 344.0015, sheet 1: D35.17 is linked once to $\overline{RD}$ (D135.9) and once to $\overline{WR}$ (D135.13)).

The microcomputer produces the $\overline{CS1}$ to $\overline{CS4}$ signals for the output unit via D178 and D179, finds out whether an output operation is being performed (run/stop $\overline{poll}$) and writes the control registers D175 to D177.

These registers contain the information on the basic setting of the sequence control and deliver all the signals required for initialization and starting the output. With the exception of the address decoder, all the blocks in Fig. 4-13 are dependent on the contents of the control registers. D158 constitutes the clock switch. Depending on the level at the address inputs (pins 11, 10, 9), the multiplexer selects handshake clock, synthesizer clock or external clock (inverted or non-inverted). D158.9 is taken to the switch selecting the active edge of the external clock and is low if the leading edge is to clock an output operation. The gate logic consists of flip-flops D162 and D163 and of the corresponding gates. The input of the gate logic is the output of the clock switch D158.5, its output D161.8. The gate is opened by the microprocessor via the control registers or by the start-ext input, thus starting an output operation. The output clock is stopped as soon as all the bit patterns are output (in the non-repetitive mode) or if the CPU or a signal from the stop-ext input is to stop the output operation. The SST clock is also fed to the gate logic.

The sequence logic consists of the three flip-flops D164I, D164II and D165I operating in step with the output clock. In the non-repetitive mode, the equal flip-flop is set as soon as the counter has reached the end address. The tristate flip-flop sets the data drivers to high impedance via tristate switches D168, D169 if line tristate is requested within an output operation or end tristate after the output operation has been terminated. The interrupt flip-flop signals to the RST 7.5 input of the CPU that a bit pattern output has been terminated and inhibits the gate and the handshake logics. The interrupt flip-flop also controls the tristate logic. In addition to multiplexers D168 and D169, the latter contains the power-on flip-flop D165II setting all the data drivers to high impedance when the IGA is switched on and gate D173III for setting the DAV output to the tristate mode. The three gates D155II, D155III and D152IV constitute the counter logic. It delivers the counter-$\overline{load}$ and counter-enable signals to the address generator of the output unit.

The handshake logic derives the output clock from the RFD and DAC signals; at the time when the data are valid, a DAV signal is generated.

4.6.2 Control Registers D175 to D177

To set the IGA to a specific mode, the sequence control and the output unit have to be provided with control signals. This is ensured by writing specific data words into registers D175 to D177.

The $\overline{\text{ENABLE}}$ signal for multiplexer D178 is produced by way of an OR operation (D135.8) from the $\overline{\text{WR}}$ signal of the CPU and the output signal of address decoder D35.17. The multiplexer decodes the three lowest address bits and delivers a negative-going pulse to the corresponding output. The information on the data bus is transferred to the selected register with the positive-going edge of this pulse.

For the signification of the individual control signals see table 4-2.

Table 4-2

Register D175			
Name	Pin	Activated by	Signification
Clock mode I	2	H/L	Selects between 2-wire (L) and 3-wire (H) handshake mode or internal (L) and external (H) clock.
Clock mode II	5	H/L	Selects between handshake mode (H) and internal or external clock (L).
Line tristate	6	H	Indicates that line tristate is allowed.
End tristate	9	H	Indicates that end tristate is allowed.
End tristate - status A to D	12-19	H	Indicates which of the data drivers (A to D) are to go to tristate at the end of the sequence.

Register D176			
Name	Pin	Activated by	Signification
$\overline{\text{Clear}}$ gate	2		Resets the synchronization flip-flop, the start flip-flop, the start-ext flip-flop and thus also the handshake flip-flop.
Clock-start flip-flop	5		Starts the IGA by setting the start flip-flop.
$\overline{\text{Set}}$-start-ext flip-flop	6		Allows external start signals by setting the start-ext flip-flop.
Clock-start-ext flip-flop	9		Inhibits external start signals by resetting the start-ext flip-flop
$\overline{\text{Set}}$-equal flip-flop	12		Sets the equal flip-flop
$\overline{\text{Clear}}$-equal flip-flop	15		Resets the equal flip-flop always and the DAV flip-flop (D160III and IV) if clock mode II is low.
$\overline{\text{Set}}$-power-on flip-flop	16		Setting the power-on flip-flop causes all the data drivers to go to the tristate mode.
Counter $\overline{\text{clear}}$	19		The address counter of the output unit is reset.

Register D177			
Name	Pin	Activated by	Signification
SST $\overline{\text{ENABLE}}$	2	L	Switches the output unit over to single-step mode.
$\overline{\text{Clear}}$ SST flip-flop	5	⊓	Resets the single-step flip-flop.
$\overline{\text{CPU access}}$	6	H/L	Indicates whether the output unit (H) or the CPU (L) is allowed to access the output files.
Repeat	9	H	Indicates whether the current module or the current module sequence is to be output in the repetitive mode (H) or only once (L).
$\overline{\text{Clear}}$ interrupt flip-flop	12	⊓	Resets the interrupt flip-flop.
Enable Hz DAV	15		Sets the DAV signal to high impedance if the DAV bit in the output data word is high.
$\overline{\text{Set}}$ interrupt flip-flop	16	⊓	Sets the interrupt flip-flop thus producing an interrupt for the CPU and inhibiting the DAC and RFD handshake signals.

4.6.3 Start Initialization

After switching the IGA on and after terminating a data output, the sequence control and the output unit are initialized for data output. This is done by consecutive setting or setting and resetting of the lines in the control registers D175 to D177 as follows:

a) The gate logic is reset, i.e.
   - the start flip-flop (D162I) is reset,
   - the output clock line is inhibited until the (next) start by resetting the synchronization flip-flop (D162II),
   - external starting of the IGA is disabled during the initialization period by resetting the start-ext flip-flop (D163I),
   - the handshake flip-flop (D153III and IV) is reset.

b) The equal flip-flop (D164I) signalling that the last data word is reached is reset.

c) The address counter of the output unit (D103 to D105) is reset (so that the next output starts again with the address 0).

d) The single-step mode is disabled.

e) The DAC and RFD lines are inhibited by setting the interrupt flip-flop (this avoids that, in the handshake mode, status changes on these lines produce DAV signals prior to the start).

f) The DAV signal is disabled by resetting the DAV flip-flop (D160III and IV).

g) The clock mode (e.g. 3-wire handshake) selected by the user is enabled (if, after switching the IGA on, a specific clock mode has not been set, the internal clock is used).

h) The external start is again allowed by setting the start-ext flip-flop if at least one data line exists for the current module or the current module sequence.

Fig. 4-5 shows the timing of the most important signals during this initialization period.

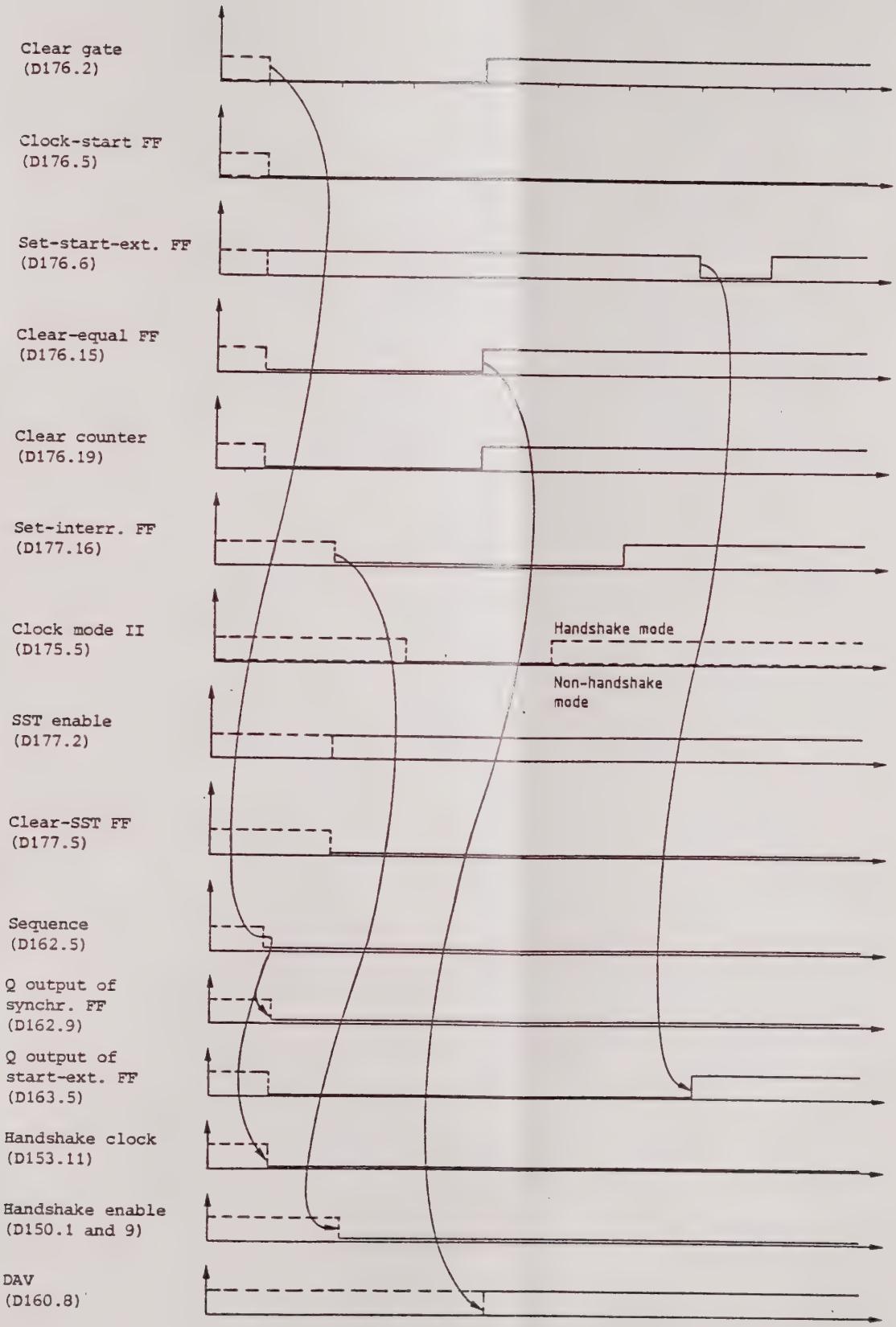


Fig. 4-5 Start initialization
(During this period, the $\overline{\text{set}}$-equal-flip-flop and $\overline{\text{clear}}$-interrupt-flip-flop signals are high, the start-ext-flip-flop clock is low).

To ensure that the DAV signal is securely disabled, the equal flip-flop may be reset at the earliest 10 µs after the last output clock. After switching the IGA on, the set-power-on-flip-flop signal is sent in addition to the above-mentioned initialization steps. In this way, all the data drivers are set to high impedance. The associated circuitry is described in section 4.6.7 (tristate mode).

4.6.4 Starting the Output

The data in the output memory are organized by the microcomputer such that the module or the module sequence to be output begins with the (RAM) start address 0. The registers of the address generator contain the end address ≠ 0, the $\overline{\text{CPU access}}$ line is high.

The bit pattern output starts (after the start initialization) with the first positive-going clock edge which appears at the output of the gate logic (D161.8). (The output clock controls the transfer of the data from the output memory to the output registers and thus to the data drivers). The gate is opened by setting the start flip-flop; then the IGA is in the RUN mode.

The output is started

- by the microcomputer upon request from the keyboard or the IEC bus (only if option IGA-B1 is fitted)
- by the external-start input.

If the microcomputer starts the output, the start flip-flop is set via the clock input: D162.3 goes first low and then high. As soon as the start flip-flop is set, the synchronization flip-flop D162II is set by the next positive-going edge that appears at the output of the clock switch (D158.5). D159.4 goes high and, since the SST flip-flop D163II remains reset via pin 13, the output clock appears at D161.8, the output of the gate logic. The synchronization flip-flop ensures that the first clock pulse is wide enough to clock the output registers and the registers of the sequence logic.

The start flip-flop is set via the $\overline{\text{PRESET}}$ pin by the external start input. D163.6 is low. A negative-going pulse at D161.1 as it is delivered by the connector panel is transferred to D162.4. This external activity is signalled to the CPU via D160II and D157I; the CPU uses the $\overline{\text{poll}}$ run/stop line (D179.7) to learn the status of the sequence control (the Q output of the start flip-flop is sampled via driver D109 of the output unit).

Since the equal flip-flop is reset (D164.5 low), the interrupt flip-flop is reset with the first edge of the output clock.

4.6.5 Ending the Output

The output is interrupted or ended

- by the microcomputer, caused by pressing the stop key, or by the corresponding IEC-bus instruction (only if the option IGA-B1 is fitted),
- by a signal applied to the external stop input or
- after all the data lines have been output in the non-repetitive mode.

In all these cases, the flip-flops of the gate logic are reset.
D162.9 goes low, thus closing the gate.

The gate logic is reset by the microcomputer with the aid of the $\overline{\text{clear}}$ gate line (D176.2) or via the external stop input by applying a negative-going pulse from the connector panel to D159.9. As in the case of an external start, an interrupt is initiated by gates D160II and D157I. By activating the $\overline{\text{poll}}$ run/stop line, the microcomputer is informed that the start flip-flop is not set and that the IGA is not in the RUN mode.

Fig. 4-6 shows how the output is ended in the non-repetitive mode (see also Fig. 4-12 in the appendix).

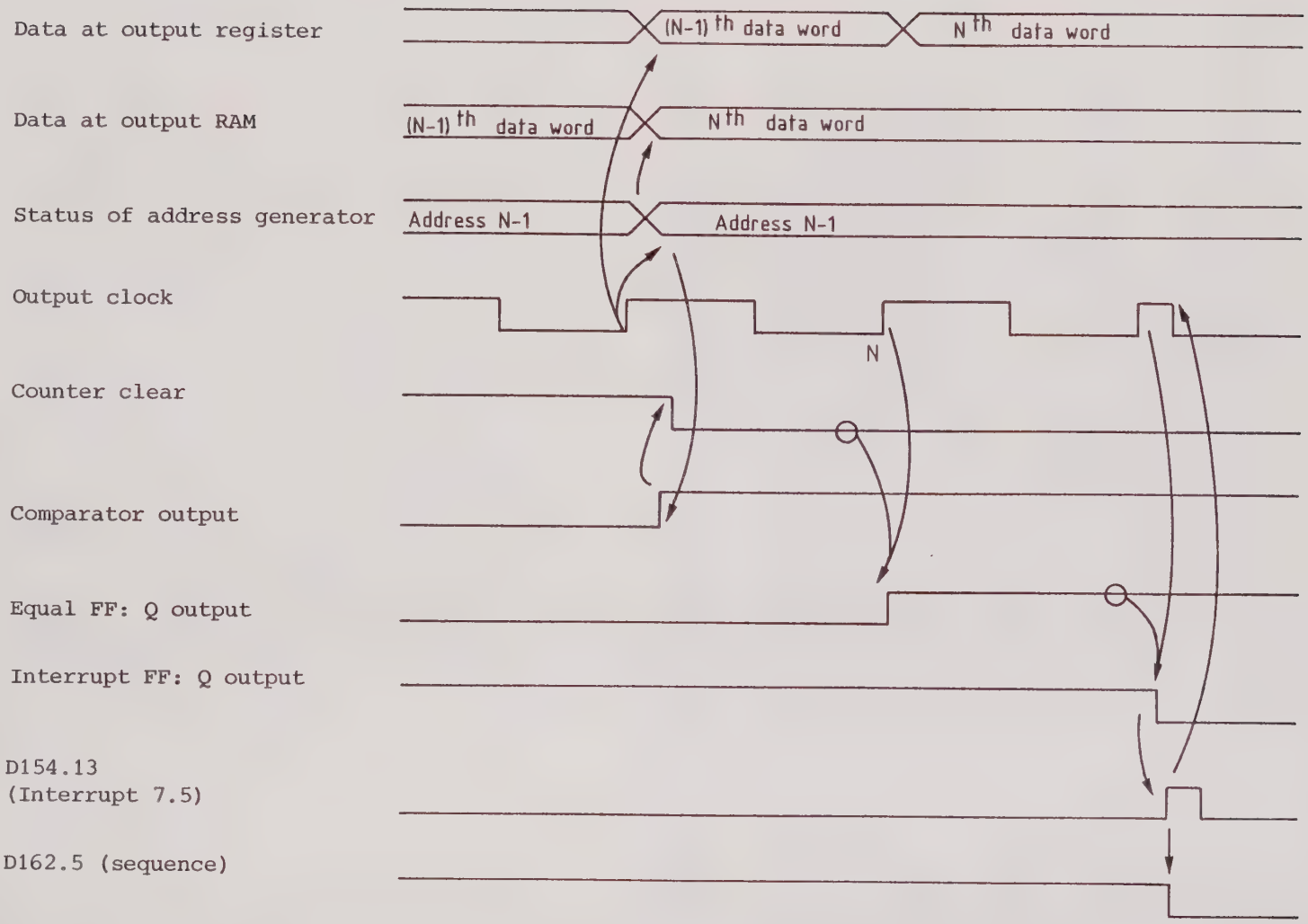


Fig. 4-6 End of a non-repetitive output

The output consists of N data words. After the $(N-1)^{th}$ output clock, the address generator of the output unit is stopped via the counter-enable line in response to the high level at the comparator output (see section 4.5.3). Thus a high level is present at the data input of the equal flip-flop (D164.2); it is set by the Nth clock pulse. D164.6 goes low and the input of the DAV generator is inhibited via D159IV. The delay gates D174I, II, IV, V ensure that the Nth output clock allows a sufficiently wide pulse to pass through in order to trigger D170I.

Since a high level is present at the data input of the interrupt flip-flop (D165.2), it is set with the positive-going edge of the next clock pulse. The transition from high to low at the $\overline{Q}$ output (D165.6) causes the hardware to act as follows:

- The tristate logic is switched (see section 4.6.7).
- Gates D167IV, V, VI and D154IV produce a positive-going pulse which causes a CPU interrupt via D157I and resets the gate logic via D174III.
- D150I and D150III inhibit the inputs of the handshake logic.

As in the case of an external start and stop, the microcomputer polls the status of the start flip-flop and initializes the next start.

4.6.6 Producing the DAV Signal in the Non-handshake Mode

Depending on the mode, the DAV signal is produced in one of the following ways:

- In the handshake mode, the DAV signal is generated depending on the status of the two other handshake signals (this generation is therefore explained together with the handshake mode).
- In the non-handshake mode, however, the beginning and the duration of the DAV signal can be set with the aid of potentiometers.

The output clock (D161III.8) is taken via D159IV to monostable D170I and starts the latter with its positive-going edge. The monostable produces a positive-going output pulse whose duration can be set by the DAV DELAY potentiometer 36 on the rear panel (see Fig. 2-3). The minimum pulse width adjustable is about 180 ns (due to the series resistor R262), the maximum duration about 7 µs.

A short negative-going pulse is produced with the aid of D171 and D172 from the trailing edge of this pulse; this negative-going pulse sets the flip-flop consisting of two NAND gates (D160III and IV), D160.11 being high. The DAV signal corresponds to the output of this flip-flop. Thus the DAV DELAY potentiometer 36 (Fig. 2-3) permits the delay for the beginning of the DAV signal to be set.

Moreover, monostable D170II is started with the trailing edge of the output pulse of D170I. The monostable output is a positive-going pulse whose width can be set by the DAV WIDTH potentiometer 36 (Fig. 2-3) on the rear panel. The minimum pulse width adjustable is about 150 ns (due to the series resistor R264), the maximum duration about 7 µs.

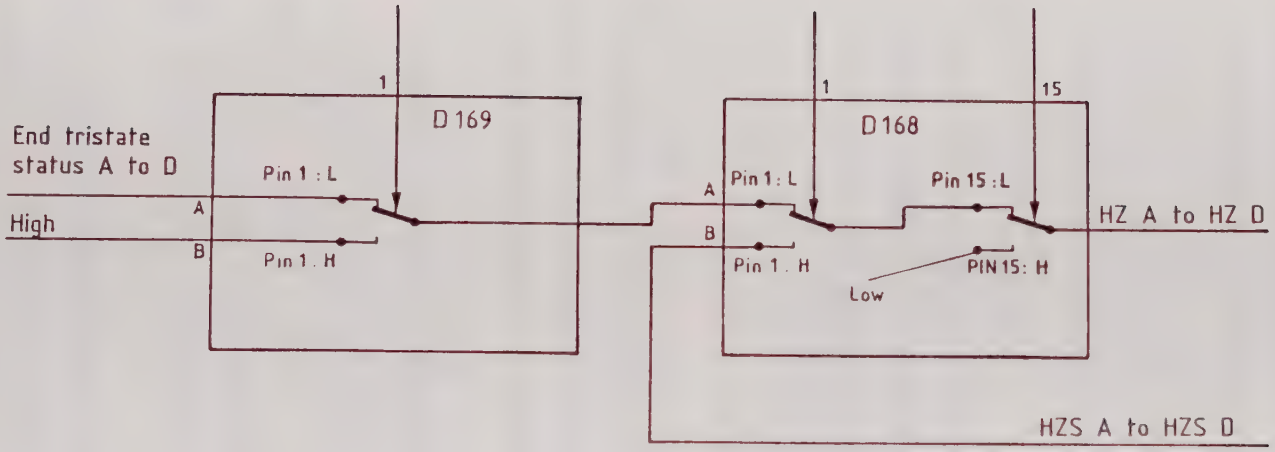
A short negative-going pulse is produced with the aid of D171 and D172 from the trailing edge of this pulse; this negative-going pulse resets the previously set flip-flop (D160III and IV) and thus the DAV signal (D160.11 = low). Thus the DAV WIDTH potentiometer 36 (Fig. 2-3) permits the width of the DAV signal to be set.

The DAV and the $\overline{\text{DAV}}$ (D160.8) signals are taken via the connector panel and the CLOCK CONTROL connector 39 (see Fig. 2-3) to the clock-control driver (see sections 4.13 and 4.14), where they are available for further use.

4.6.7 Tristate Mode

The functioning of the two tristate switches D168 and D169 is shown in Fig. 4-7. If the outputs HZ A to D are high, the corresponding data drivers are set to high impedance. This applies in the following cases:

- when the IGA is switched on,
- if within an output operation line tristate or
- after termination of an output operation end tristate or
- via the HIGH Z input tristate is requested or
- if the STOP key is pressed.



	D169, Pin 1	D168, Pin 1	D168, Pin 15
Switching on:	High	Low	Low
Line tristate:	Low	High	Low
End tristate:	Low	Low	Low
HZ extern:	Low	Low	Low
Bit pattern output:	Low	High	High

Fig. 4-7 Functioning of tristate switches D168, D169

When the IGA is switched on, the initialization program sets the power-on flip-flop whose Q output drives the select pin of D169.1 and enables the high levels at the B inputs to pass through. The $\overline{Q}$ output of D165II is taken via gates D166IV and D159III to the select pin of D168 and via D166IV and D159I to the $\overline{\text{ENABLE}}$ pin of the second tristate switch: D168.15 and D168.1 are low. Thus the outputs HZ A to D are high. The first output clock resets the power-on and the interrupt flip-flops. The levels written into the bits corresponding to end tristate status A to D (register D175) appear at the output of D169. D168.1 and D168.15 go high, thus all the data drivers are activated.

Line tristate is enabled by setting the bits corresponding to line tristate in control register D175. D175.6 is taken to D166.2. The tristate control bit (D166.1) delivers a high level if, after the next positive-going edge of the output clock, data drivers are to be set to high impedance (see section 4.5.1). Since the data input of the tristate flip-flop (D164.12) is high, it is set by this edge. $\overline{Q}$ activates switch D168 with the delay introduced by gates D118I, III, IV, V. In the meantime, high has appeared on those of lines HZS A to D which are to set the output channels to high impedance. The interrupt flip-flop is not set and D168 through-connects the B inputs.

End tristate occurs if all the data lines have been output in the non-repetitive mode or if the output has been stopped at the last data word. The levels on lines end tristate A to D determine the channels which are set to high impedance. The end tristate mode is enabled via control register D175.9.

When the end address is reached, D166.4 is high. If an output consists of N data words, the equal flip-flop is set with the Nth output clock (see Fig. 4-14). D164.12 is high. The last clock pulse thus sets the interrupt and the tristate flip-flops. Like in the case of line tristate, multiplexer D168 is activated. Since D165.6 is low, it switches the outputs of D169 (which is connected to the A inputs), i.e. the tristate status lines to the outputs HZ A to D.

Even with an external HZ request, the tristate status lines determine which data drivers are to be set to high impedance. D168 selects the A inputs via D166IV and D159III; D169 activates the switch (D169 is connected to the A inputs).

A high level at D173.8 sets the outputs of the clock driver to tristate. If this is desired, a data channel has to be reserved as for line tristate. If D177.15 is high, the clock driver goes high impedance on the data line which includes the fifth bit in significance for model 03 and the third bit in significance for model 02.

4.6.8 Handshake Mode

Handshake operation is a mode in which the IGA does not output the data at fixed intervals but only when it is told by the listener that the latter is ready for data (RFD). The IGA sends the data-valid (DAV) signal to tell the listener when it may accept the output data.

It is possible to select 3-wire and 2-wire handshake on the IGA.

4.6.8.1 3-wire Handshake

The circuitry is designed such that the timing of the handshake operation conforms to the IEC-bus standard.

For the basic functioning of the 3-wire handshake see Fig. 2-6 and section 2.6.

Before any data output is started, the IGA is in a well-defined status (see section 4.6.3).

Switchover to the handshake mode is performed by setting D175.5.
In this way,

a) multiplexer D158 is switched over to handshake logic,

b) the output of monostable D170I (DAV delay setting) is inhibited via D173II and that of monostable D170II (DAV width setting) via D173I and

c) gate D173IV is enabled for the DAV set signal and gate D166III for the DAV reset signal.

Setting clock mode I (D175.2) enables the RFD signal at D156I, inhibits the DAC signal at D150IV and thus switches to 3-wire handshake. During this switchover, no data are output, the run signal is low.

After the initialization, the IGA can be started. When starting the IGA by a keystroke or an IEC-bus command (only if option IGA-B1 is fitted), the microcomputer causes the clock-start flip-flop line (D176.5) to go high, thus setting the start flip-flop (D162I). If an external start signal is applied, this is taken via D161I to the start flip-flop which is set via its preset input.

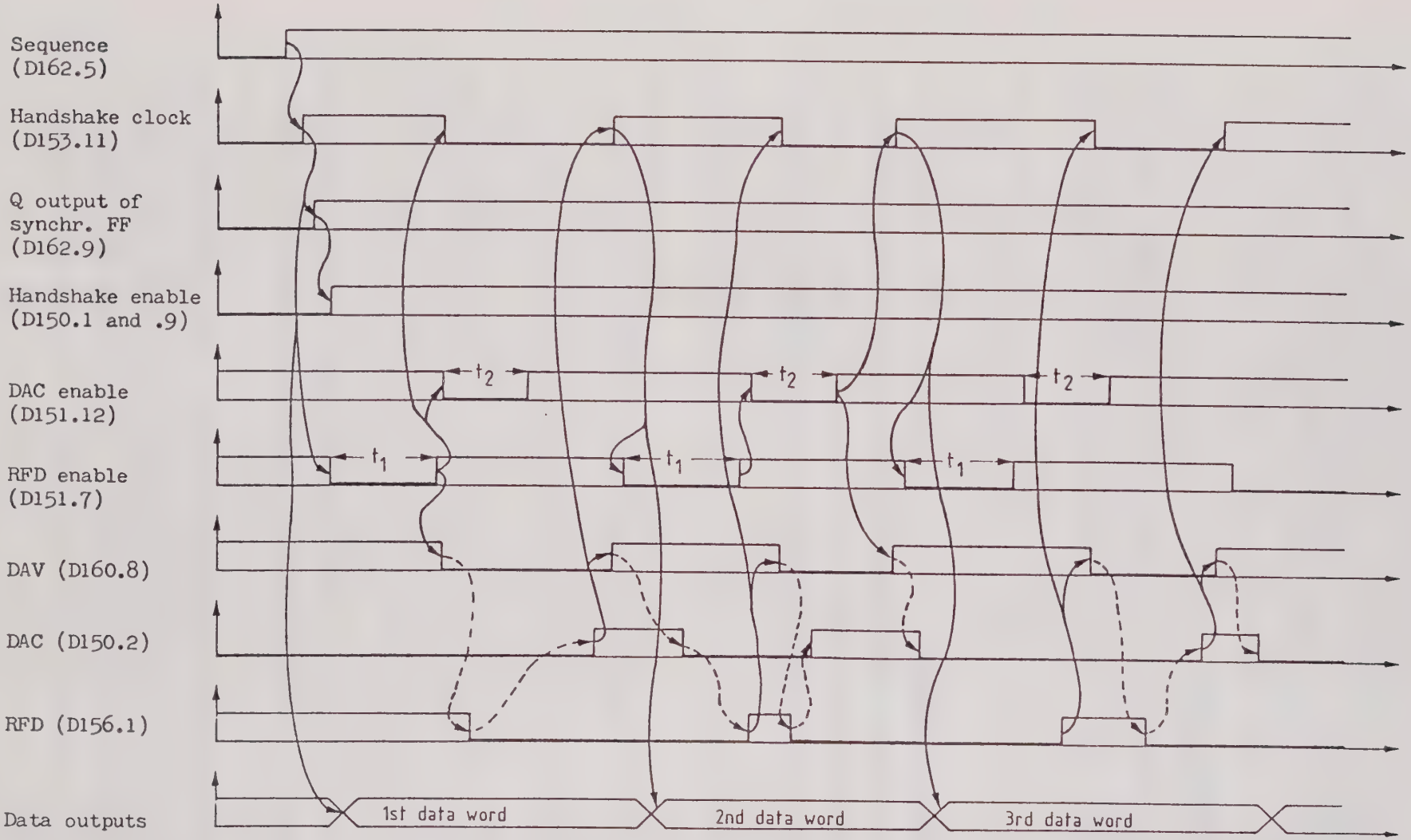


Fig. 4-8 Timing diagram for starting data output in the 3-wire handshake mode

Fig. 4-8 shows the timing of the output of the first 3 data words. A negative-going pulse is produced from the positive-going edge of the run signal (D162.5) with the aid of D152I to III and D153II. At this specific moment D150.4 is high since the handshake inhibition is not yet disabled (D150.1 = low). The pulse is thus allowed to pass through and sets the handshake flip-flop consisting of two NAND gates (D153III and IV).

The output of the handshake flip-flop constitutes the handshake clock which is taken via multiplexer D158 to the synchronization flip-flop (D162II). This flip-flop is set with the leading edge and thus applies the clock (D159II) to the output clock line (D161.8). This causes the first data word to be made available in the output unit. Moreover, the positive-going edge of the clock resets the interrupt flip-flop (D165I) (the D input is low since the equal flip-flop had been reset during the basic setting) and thus enables the DAC and RFD lines.

The RFD signal (if already sent by the listener) is now taken via D167I and II or D154II and III to gate D153I where it is allowed to pass through only if the $\overline{Q}$ output of monostable D151I is high.

This monostable has been started with the positive-going edge of the handshake clock signal. It delivers a negative-going pulse of about 600 ns (T1 in Fig. 4-8).

This handshake inhibition is provided for the following purpose:
In accordance with the IEC-bus standard, an IEC-bus-compatible device is required to bring its two handshake lines, NRFD and NDAC, to a valid status only 200 ns after application of the ATN signal. However, one application of the IGA consists in outputting this ATN signal as the first data word (see application note). Thus the NRFD signal may be sampled at the earliest 200 ns after the first data word has appeared at the output. To ensure this timing, the above-mentioned inhibition has been provided by way of monostable D151I.

The switching times of gates D167I and II or D154II and III ensure that an RFD signal which has been allowed to pass through by the handshake enable line (D150III) since it may have been present prior to the start of the IGA reaches gate D153I only after the inhibition has become effective.

The RFD signal is inverted by D153I and then taken via D173IV (D173.12 is high in the handshake mode) and D161II (D161.4 is low in the handshake mode) to D171I. D171I to III and D172II produce a negative-going pulse from the

negative-going edge of the signal; this pulse sets the DAV flip-flop (D160III and IV) constituted by two NAND gates (D160.11 = high). The DAV signal corresponds to the output signal of this flip-flop.

The above-mentioned, negative-going pulse is also applied via D156II to the reset input of the handshake flip-flop (D153.10); D156.4 is connected to the run line and is thus high. In this way, the handshake clock is again disabled.

The DAV signal causes the listener to disable the RFD signal and to send DAC. The DAC signal is taken via D150I to D155I which allows it to pass only if the $\overline{Q}$ output of monostable D151II is high. Monostable D151II has been started with the leading edge of the $\overline{Q}$-output signal of monostable D151I. It delivers a negative-going pulse of about 100 ns.

In conjunction with the RFD inhibition of monostable D151I, this inhibition ensures that two clock signals do not follow each other more quickly than they can be processed by the output unit.

The DAC signal is inverted by D155I and taken via D150II (D150.5 = high) to the handshake flip-flop; this is set, thus producing a new clock which ensures at this time already that the next output word is made available.

D155I takes the DAC signal also to D172III. In the handshake mode, D172.9 is low and a negative-going pulse can thus be produced by gates D171IV to VI and D172I; this pulse resets the DAV flip-flop (D160III and IV) constituted by two NAND gates and thus disables the DAV signal (D160.11 = low).

Disabling the DAV signal causes the listener to disable the DAC signal and to send RFD.

This terminates the output of the first data word and the cycle starts again for outputting the next word (see Fig. 4-8).

Fig. 4-9 shows the timing of the main signals described above at the moment of terminating an output operation. The output of three data words in the SINGLE mode is represented.

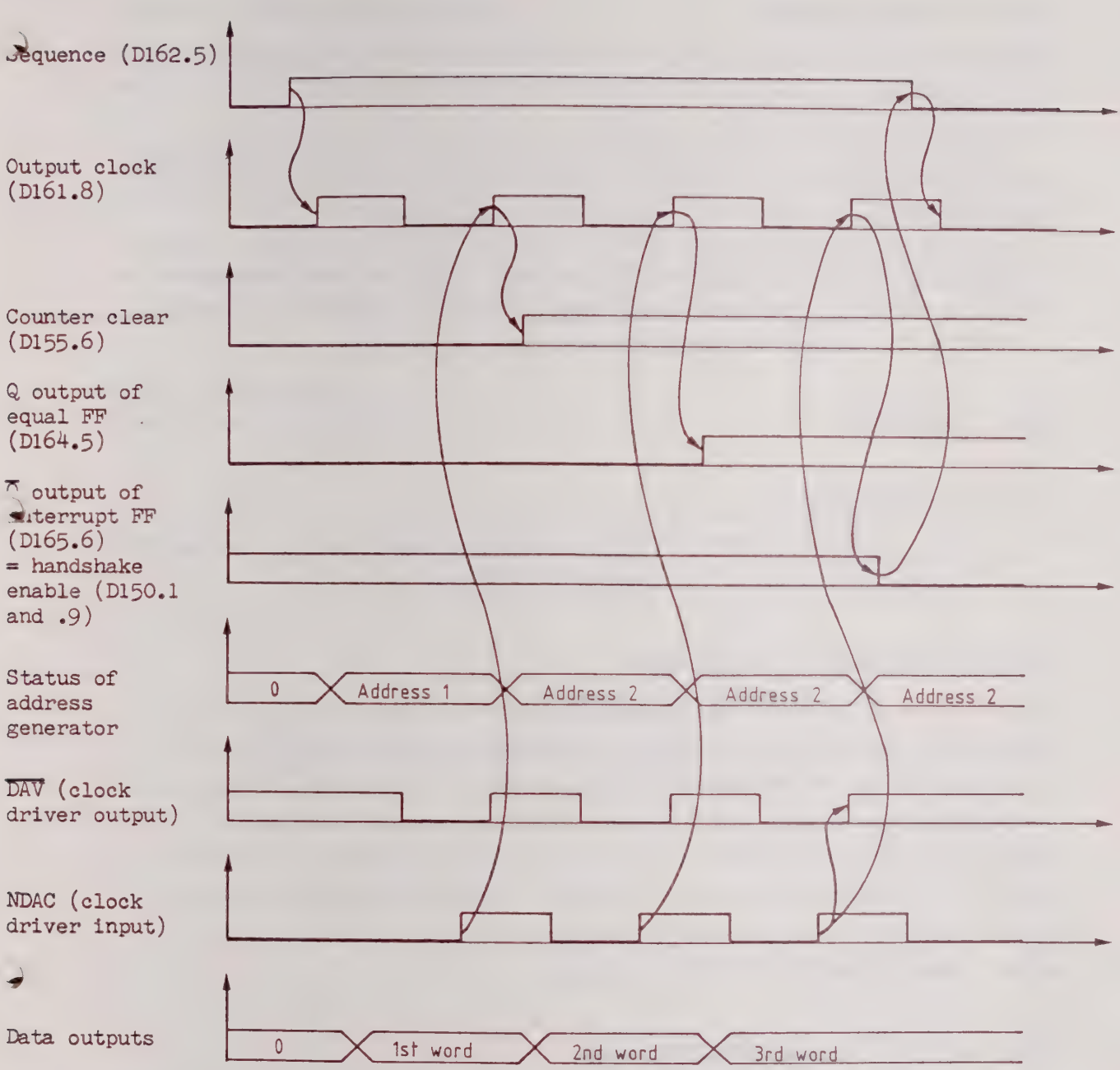


Fig. 4-9 Timing diagram for outputting 3 data words in the handshake mode (non-repetitive)

4.6.8.2 2-wire Handshake

For the basic functioning of the 2-wire handshake see Fig. 2-7 and section 2.7.

A control logic of its own is not provided for the 2-wire handshake. By inverting the DAC signal, a pseudo-RFD signal is produced and used to operate the control logic provided for the 3-wire handshake mode.

The only exception is that during the initialization the 2-wire handshake mode is selected by resetting clock mode I (D175.2) to inhibit the RFD signal at D156I and to enable the inverted DAC signal at D150IV.

4.6.9 SST Mode

4.6.9.1 Initialization

In the control register, D177.1 (SST enable) is brought low; the SST and the equal flip-flops are reset, the interrupt flip-flop is set.

4.6.9.2 Producing the Output Clock

The SST clock is produced by clocking and resetting the SST flip-flop D163.II. The microcomputer consecutively reads the current line from the individual RAM pairs of the output unit and writes the memory contents into the display (see section 4.5.4). Addressing the highest-order pair by $\overline{\text{CSRAM D}}$ enables all the RAMs of the output memory; the $\overline{\text{SST}}$ line (D172.13) goes low. The $\overline{\text{RD}}$ pulse present at D172.12 is taken to the clock input of D163II, the data input is high and the flip-flop is set. Next the CPU produces a reset pulse using D177.5.

4.6.9.3 Starting and Ending the Output

The first data word at the output registers appears in response to the first (output) clock pulse. With each step, the microcomputer addresses a new line. If first a step-up is requested, no signal appears.

The output is ended by the microcomputer - requested by means of a keystroke or via an IEC-bus command - or by the external stop input. Then the CPU starts to initialize the next start.

4.6.9.4 Reaching the End Address

If the microcomputer has output the last data line and another step-down is required, the CPU must first set the equal flip-flop via control register D176. In this way, any DAV pulse is suppressed. The microcomputer again addresses the last data line, the output clock sets the interrupt flip-flop and the tristate logic selects the specified end tristate. A step-up resets the equal flip-flop and thus enables the DAV-signal generation. Since the data input D165.2 is now again low, the output clock causes the interrupt flip-flop $\overline{Q}$ to go high and thus the end tristate is disabled.

4.7 Synthesizer

(See circuit diagram 344.0515 S)

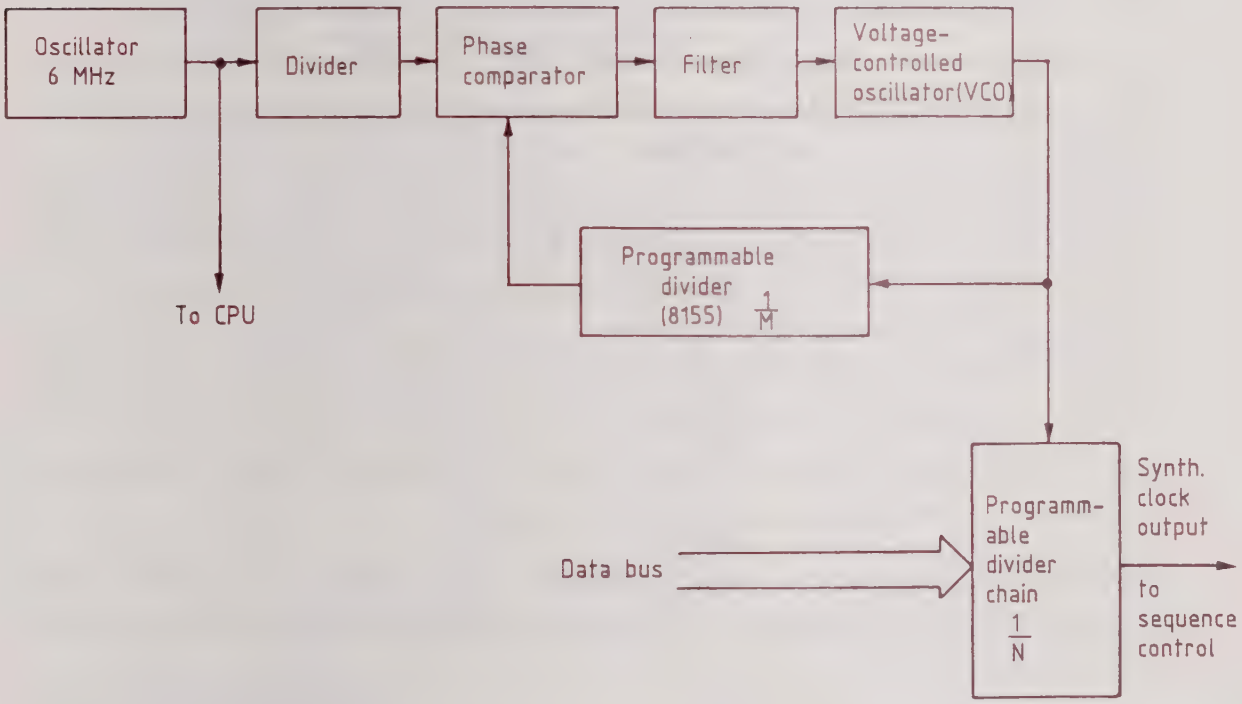


Fig. 4-10 Block diagram of synthesizer

The synthesizer delivers the clock for the CPU and, if the IGA is set to internal clock generation, also the output clock (see section 4.6).

The 6-MHz crystal B1 and gates D1I to III are connected in an oscillator configuration. Capacitor C21 permits the oscillator to be tuned accurately

to 6 MHz. The signal is taken via interface X150.4 to the CPU. For the output clock generation, the 6 MHz-signal is divided down to 1 MHz by D2I, then further down to 10 kHz by D3 and applied to the reference-frequency input of phase comparator D4.

D4 compares the reference signal with the signal applied for correction to its second input D4.3. If the frequency and phase of the two signals coincide, D4 sets its output to high impedance. If the signal to be corrected lags behind the reference signal, the phase comparator delivers +0.75 V; if it leads, the comparator produces pulses of +2.25 V. The pulse width is proportional to the phase error. The pulses are filtered and applied to the inverting integrator (N2 configuration). Boosting the potential at its non-inverting input to about 1.3 V ensures that its output voltage is reduced by the 2.25-V pulses and increased by the 0.75-V pulses. Thus a voltage proportional to the nominal frequency is present at the output of the integrator.

A constant current proportional to the nominal frequency is produced from this voltage with the aid of operational amplifier N1, transistor V1 and resistor R22. This current charges capacitor C28 until the base voltage at transistor V3 is lower than that at transistor V4. As soon as this state is reached, the Schmitt trigger constituted by these two transistors switches over, i.e. V4 conducts and thus switches transistor V5 on. Capacitor C28 discharges via resistor R23 and transistor V5 until the base voltage at V3 becomes higher than the voltage present at the base of V4. As soon as this state is reached, the Schmitt trigger switches back to its initial state and a new charging operation starts. Due to the circuit design, discharging of the capacitor is much quicker than charging.

Transistor V7 brings the voltage pulses at the collector of V4 to TTL level. The subsequent 1:2 divider D5I yields a 1:1 mark-to-space ratio for the squarewave signal.

This VCO output signal is taken via interface X150.6 to the programmable divider D70 where it is divided by the constant stored and then applied via interface X150.5 to the second input of the phase comparator (D4.3). At this point, the signal has the same frequency and phase as the reference signal derived from the crystal (D4.1). Otherwise, the phase comparator would tune the VCO until this condition is met (PLL).

The output signal of the VCO (D5.9) is divided in a programmable divider chain (D5II, D6, D7, D8). D5II divides the signal by 2 and 4, D6 to 8 divide it each twice by 10.

One of the signals can be taken to the output by means of multiplexers D11 and D9. The multiplexers receive their control information from register D10 which the microcomputer sets by writing a data word. The associated $\overline{CS}$ signal is obtained by decoding the addresses (D35 on the motherboard).

Thus the desired frequency is set in accordance with the following equation:

$$f = \frac{M}{N} \times 10 \text{ kHz},$$

where M is the division factor in the feedback loop (D70), N the division factor of the programmable divider chain (D5II, D6, D7, D8) and 10 kHz the frequency of the reference signal.

Table 4-3 shows which data lines must be set to adjust the divider chain of the synthesizer for a specific division factor.

Table 4-3 Division factors and associated data words for setting the division chain of the synthesizer

Data lines			Data lines					
D2	D1	D0	D4	D3	D4	D3	D4	D3
			0	0	0	1	1	0
0	0	0	$10^0=1$		$2\times10^0=2$		$4\times10^0=4$	
0	0	1	$10^1=10$		$2\times10^1=20$		$4\times10^1=40$	
0	1	0	10^2		2×10^2		4×10^2	
0	1	1	10^3		2×10^3		4×10^3	
1	0	0	10^4		2×10^4		4×10^4	
1	0	1	10^5		2×10^5		4×10^5	
1	1	0	10^6		2×10^6		4×10^6	

4.8 Connector Panel

(See circuit diagram 344.0473 S)

Inverters D201 to 205 (IGA 03) or D203 to D205 (IGA 02) deliver the signals for the data and clock drivers.

The signals at pins X200a9 to a12 can be polled by the CPU via the I/O port D70. In this way the CPU identifies the position of switches S20 to S23.

Moreover, the signal at pin X200a12 switches multiplexer D158 (see section 4.6) between the non-inverted and the inverted external clock signal and thus selects the active edge.

The DAV DELAY and DAV WIDTH potentiometers 36 (Fig. 2-3) permit the pulse widths of monostable D170 (see section 4.6) to be varied.

The supply voltage for the general-purpose drivers (options IGA-Z1 and IGA-Z2) is set in the power supply with the aid of the VAR LEVEL potentiometer 36.

Two negative-going pulses are produced via gates D206IV to VI and D207II or D208II from a squarewave signal at the stop input X212, one from the leading and the other from the trailing edge. Switch S21II selects either of these signals and applies it to the sequence control.

A high level at the HIGH-Z input causes, via transistors V1 and V2, pin a23 to go low. With the input open, pin a23 is high.

The NRFD, NDAC and START EXT inputs are terminated with the characteristic impedance of the clock driver cable. If the input is open, the corresponding outputs a8, a7 and a22 are high.

S22II permits the polarity of the end signal coming from the sequence control to be reversed. It is inverted by D205 and taken via X213 to the BNC connector 42 (Fig. 2-3). Diodes V5 and V6 protect the END output against too high or too low voltages. Incandescent lamp H1 is used for limiting the current in the case of overload.

4.9 IEC-bus Interface (Option IGA-B1)

(See circuit diagrams 344.2818.02 S and 334.0450 S, sheet 2)

The IEC-bus interface conforms to the IEC-bus standard. The ADDRESS switch 44 (Fig. 2-3) on the rear panel permits the desired device address to be set and one of the two end characters CR (carriage return) or LF (line feed) to be selected. The CPU polls this switch via its I/O port D70.

The IEC-bus controller (D80) receives its 3-MHz clock from the clock output of the CPU (D50.37), the reset signal from its reset output (D50.3).

The controller is addressed by a chip-select signal (at pin 8) delivered by the address decoder (D35.9). It can be programmed by the CPU via the data bus and the address lines A0 to A2.

The CPU writes the character to be output into one of the registers of the controller using the data bus. The controller handles the transfer of this character via the IEC bus with the aid of the bidirectional drivers (D81 to D84). If the controller has received a character from the IEC bus, it stores this character temporarily and informs the CPU by an interrupt (RST 5.5) that it should read out this character.

See the IEC standard for the control signals used for data transfer via the IEC bus and the signal timing.

4.10 Cassette Drive (Option IGA-B2)

(See circuit diagram 344.2918 S)

The cassette recorder A1 is a serial, peripheral device. Data from and to the drive are transferred via the SOD and SID pins of the microprocessor. The latter also handles the PE coding and recognizes read errors.

The interface stores the required control signals. Since the cassette recorder uses a +12-V logic, level conversion is necessary.

The signals on the $\overline{\text{REV}}$, $\overline{\text{FWD}}$, $\overline{\text{WCD}}$ lines (X302.9, X302.10, X302.8) determine whether the tape is transported in the reverse or the forward direction ($\overline{\text{REV}}$ or $\overline{\text{FWD}}$ being low) and whether a write operation is performed ($\overline{\text{WCD}}$ being low). These control signals are stored in D301 (used as a register); D304 is used for level conversion. The microcomputer addresses the cassette interface by means of the $\overline{\text{EN}}$ signal and is able to write D301 via the data bus with the leading edge of $\overline{\text{WR}}$ (X310.10 is taken to the address decoder D35 of the microcomputer; see Fig. 4-2).

The cassette recorder has the following outputs: $\overline{\text{CIP}}$ (cassette in position), $\overline{\text{WEN}}$ (the plug is present), $\overline{\text{BET}}$ (beginning/end of tape), RDC (read clock) and $\overline{\text{RDA}}$ (read data). The signals on these lines are converted to TTL levels by D303. Activating $\overline{\text{EN}}$ enables the CPU of the IGA to read in the cassette status via the data bus using the 2Y outputs of the tristate driver D302. The 1Y outputs of D302 are always active. A read clock causes a CPU interrupt and causes the CPU to read in one bit via the SID input.

The serial output of the microprocessor (SOD) delivers the write data. They are brought to the required level by D304 and applied to $\overline{\text{WDA}}$ (X302.6).

In the case of an AC supply failure, the TRAP input (X310.2) is high. V300 conducts (D300IV is low) and thus the $\overline{\text{REV}}$, $\overline{\text{FWD}}$ and $\overline{\text{WCD}}$ control inputs are high. Any tape activity is stopped.

As the outputs of LS ICs which are not supplied with any operating voltage constitute a low-impedance path to ground, capacitor C302 is certain to be discharged via R301 and D300IV if the IGA is switched off. After switching the IGA on, the voltage across C302 rises slowly so that the $\overline{\text{REV}}$, $\overline{\text{FWD}}$ and $\overline{\text{WCD}}$ control lines are first high irrespective of the contents of register D301 (the microcomputer can reset D301 only after $\overline{\text{RESET IN}}$ is high).

By polling data line D3 with the address of the cassette drive, the CPU learns whether the cassette drive option is fitted.

The cassette recorder A1 is a replacement unit. The position of the potentiometers must not be changed.

4.11 Power Supply

(See circuit diagram 344.0450 S, sheet 5)

4.11.1 General

Fig. 4-11 shows a block diagram of the power supply which is fed from the secondary of the power transformer. After rectification and smoothing, a DC voltage of 20 to 30 V is available. The following supply voltages are derived from this DC voltage:

- +5 V by a switching power supply section for the TTL chips,
- +12 V by a (fixed-voltage) series regulator for the synthesizer and the cassette drive (only if option IGA-B2 is fitted),
- a voltage in the range from 3 to 17.5 V by an adjustable series regulator for the general-purpose drivers (option IGA-Z1 or IGA-Z2).

The +5-V output feeds the section which supplies the CMOS RAMs of the IGA with the operating and data-protection voltages and charges the built-in nickel cadmium storage cells.

In addition, the +5-V output supplies a circuit which produces a power-fail signal across the smoothing capacitor if the voltage falls short of a given threshold. By monitoring the +5-V line, the RAM CEPF signal and, considering the power-fail signal, the $\overline{\text{RESET IN}}$ signal are produced.

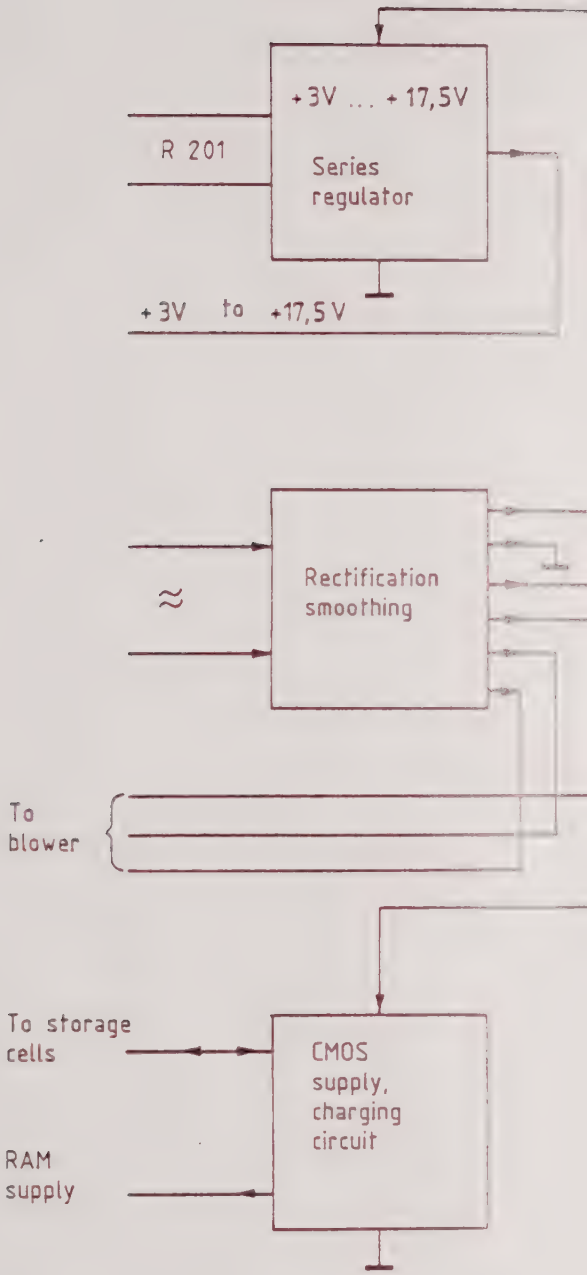
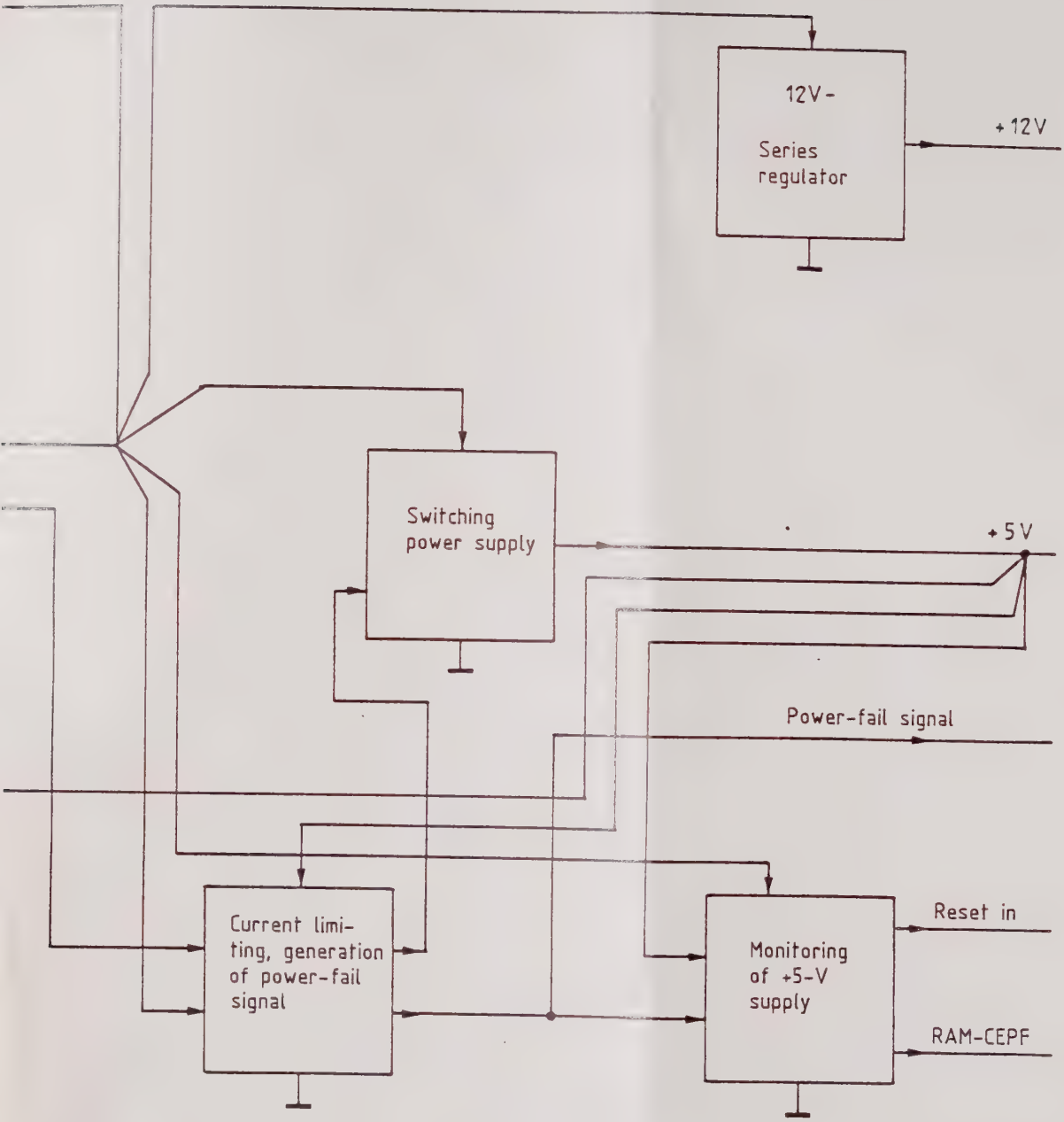


Fig. 4-11 Block diagram of power su


12V-
Series
regulator
+12V
Switching
power supply
+5V
Power-fail signal
Current limi-
ting, generation
of power-fail
signal
Monitoring
of +5-V
supply
Reset in
RAM-CEPF

ply

4.11.2 Rectifying and Smoothing the Transformer Voltage

The secondary voltage of the power transformer is rectified by V20 and applied to the smoothing capacitor C50 whose negative end is taken to ground via R50, C51. The voltage drop across these components delivers the input signal for the current limiting circuit of the switching power supply section.

The AC blower is driven directly from the power transformer. C59 delivers the required third phase.

R90 and C52 dampen the high-frequency oscillations of the rectifier when the charging current stops.

4.11.3 Switching Power Supply Section

An "on" converter produces the +5-V supply voltage. V23 is the switching transistor, V26 the free-wheeling diode and C58 the filter capacitor. V23 is driven via V22 and V21 by the switching regulator N12. If V21 conducts, the switching transistor receives its base current via the collector-emitter junction of V22 from a winding of the storage choke and is brought to saturation. This configuration ensures rapid switching on by peak-current control. The switching regulator N12 contains the control amplifier, pulse-width modulator, a temperature-stabilized internal voltage reference, a stabilized voltage source (pin 2) and various protective circuits. N12 is supplied via pin 1 (current application).

R55 and C55 determine the frequency of the pulse-width modulator which can be observed at N12.8. C54 is charged by N12.2 via R54. The voltage across C54 determines the maximum mark-to-space ratio. Input N12.3 and output N12.4 of the control amplifier are brought out; the gain is determined by R60/R68. C57 reduces noise and hum effects. Collector N12.15 and emitter N 12.14 of the output stage are made available. Since the collector potential must be lower than the voltage at N12.1, a divider is provided.

When the IGA is switched on, C58 and C54 are not charged. The voltage at the input of the control amplifier N12.3 is in any case lower than 3 V. A protective circuit in N12 interprets this status as a shortcircuit of the control loop and internally connects a 1-kΩ resistor in parallel with R55. Therefore the voltage across capacitor C54 rises only such that a duty cycle of about 5% is established for the pulse-width modulator. Only after C58 has been charged to such a value that 3 V are exceeded at pin 3 of N12, is the parallel connection of the internal 1-kΩ resistor and R55 cancelled

and the duty cycle increases with the voltage across C54 until the control action starts (soft start).

The current limiting circuit becomes active as soon as the voltage at the comparator input N10.8 decreases below that at N10.9. N10.14 delivers a high level to N10.1 which then suppresses its output pulses and discharges C54 via an internal resistor (the duty cycle of the pulse-width modulator becomes zero).

If the switching transistor is inhibited, the current in the input circuit decreases and the comparator output N10.14 goes low again. The switching regulator starts again to deliver output pulses which slowly increase in width.

If the cause of overloading has not been eliminated, the energy in the switching power supply section is limited by a periodic switching off and slow switching on.

N10 and the voltage divider R77/R78 are supplied from the +5-V output. Therefore (and because of the great time constant introduced by R77, C66), the current limiting circuit is not effective when the IGA is switched on.

Overvoltages at the +5-V output are safely suppressed by diode V27. With a high load (e.g. in the case of a defect of the switching transistor V23 or the driving circuit) V27 conducts and the AC supply fuse is caused to blow.

4.11.4 +12-V Series Regulator Section

The fixed-voltage regulator N13 supplies the synthesizer and the cassette drive (only if option IGA-B2 is fitted). It includes a current limiting facility and a thermal overload protection. C60 and C61 are used to stabilize the regulator characteristics.

4.11.5 Series Regulator Section for +3 V to 17.5 V

Transistor V25 is driven via N11.10 such that the voltage difference between the inputs (N11.4 and N11.5) of the control amplifier is reduced to a minimum. The divider comprising R80, R81 and R201 is fed with a stabilized reference signal brought out at N11.6. R201 is accessible on the rear panel of the IGA and permits the high level of the general-purpose drivers (options IGA-Z1 and IGA-Z2) to be set.

N11.2 and N11.3 are current sensors. V25 is switched back as soon as the voltage drop across R86 has reached about 0.6 V.

4.11.6 Producing the Power-fail Signal

When the IGA is operated with the permissible AC supply voltages, at least +20 V are present across the filter capacitor C50. A power-fail signal is produced if the voltage across this capacitor falls short of +18 V.

If the AC power fails or the IGA is switched off, C50 contains enough energy to keep the +5-V supply going for about 15 ms (the switching power supply section uses input voltages of > 14 V). This period is required by a rescue routine to bring the data and the hardware to a defined status.

The voltage across C50 is divided by R70, R71 and compared with the level at N10.10. Output N10.13 drives the input of the next comparator whose output delivers the power-fail signal. Even if the voltage across C50 decreases several times briefly below the +18-V limit, R74 and C65 ensure that the power-fail signal is always longer than 15 ms. Thus the rescue routine can be fully run without any interruption.

4.11.7 Producing the $\overline{\text{RESET IN}}$ and RAM CEPF Signals

The $\overline{\text{RESET IN}}$ and RAM CEPF signals are produced by a circuit which monitors the +5-V supply voltage. For this purpose, the window discriminator D401 is used. It receives its operating voltage from the +10-V reference source D400 and the window limits via divider consisting of R400 to R403. If the +5-V supply voltage (D401.8) is lower than the threshold voltage at D401.7, the two open-collector outputs D401.2 and 3 start to conduct. C401 is discharged, V400 inhibited and $\overline{\text{RESET IN}}$ and RAM CEPF are low. If the +5-V supply voltage is within the permissible limits, the two open-collector outputs of D401 are inhibited. V400 conducts and CEPF is high.

If, after the IGA has been switched on, no power-fail signal appears, the open-collector output D402.8 carries no current and C401 can charge via R409. $\overline{\text{RESET IN}}$ goes high, D402.11 low.

If the IGA is operated from too low AC supply voltages, it may happen that the power-fail signal appears during the build-up of the +5-V supply voltage. In this case, it is not ensured that the TTL supply remains stable for 15 ms. Therefore $\overline{\text{RESET IN}}$ is kept low by D402.8.

4.11.8 Supplying the CMOS RAMs; Charging Circuit

The nickel cadmium storage cells included in the IGA are charged via R130 and V101 from the TTL supply. Diode V101 suppresses any reverse current when the IGA is switched off.

In this case, the CMOS RAMs receive the data-protection voltage via V105 from the storage cells. V108 is inhibited and thus V106 does not carry any current.

When the IGA is switched on, V108 conducts and drives V106 to saturation. The base potential across V105 increases beyond the voltage at the emitter; V105 is inhibited. The operating voltage for the RAMs is at least 4.8 V.

4.12 TTL Data Drivers

D1, D2 and D3 produce from the input signals the inverted output signals with the fan-out given in the specifications. The $\overline{HZ}$ signal (active low) permits all the outputs to be set to high impedance.

Diodes V1 to V16 protect the output drivers against too high or too low voltages.

Incandescent lamps H1 to H8 are used for limiting the current in the case of overloading. If the current exceeds approx. 50 mA, they start to glow.

The basic unit and the TTL data drivers are not damaged if a data driver is erroneously connected to the CLOCK CONTROL connector 39.

4.13 TTL Clock Driver

D1 produces from the $\overline{DAV}$ input signal the three DAV, $\overline{DAV}$ and handshake DAV output signals with the fan-out given in the specifications.

The $\overline{HZ\text{-}DAV}$ signal (active low) permits the three DAV outputs to be set to high impedance.

D4 is used as a line driver for the NRFD, NDAC and START signals. The handshake-DAV output and the NRFD and DAC inputs are terminated with the impedance values specified by the IEC-bus standard.

A positive voltage step is produced at D2.8 from a start event at one of the two start inputs (a positive-going or negative-going edge depending on the input). A short, negative-going pulse which sets the start flip-flop in the sequence control is formed from this step with the aid of D3V and D2IV.

Diodes V1 to V14 protect the input and output gates against too high or too low voltages.

The incandescent lamps have the same function as in the case of the TTL data driver. However, only lamps H5 to H7 are visible from the outside.

The basic unit and the TTL clock driver are not damaged if the clock driver is erroneously connected to a data connector. In this case, a high level is present at D4.1 instead of the normal, low level. Thus D4 is brought to high impedance and a conflict with the output drivers of the connector panel is avoided.

4.14 TTL Multi-clock Driver (Option IGA-Z6)

(See circuit diagram 344.3914 S)

The multi-clock driver is supplied with inverted data from the connector panel. As in the case of the TTL data drivers, the input signals are buffered by driver D1.

The data on the input lines $\overline{D0}$ to $\overline{D3}$ are separately combined with the $\overline{DAV}$ signal in NOR gate D3. D4 functions as an inverter. If one of lines D0 to D3 is low, a positive-going or negative-going pulse with the width of the DAV signal supplied by the IGA appears at the multi-clock driver output depending on the position of the corresponding slide switch.

Diodes V1 to V16 protect the output stages against too high or too low voltages injected into the output. Lamps H1 to H8 limit the current in the case of overloading.

5. Repair Instructions

Apart from its power supply and the synthesizer the IGA is a digital instrument.

The instructions for repair of the two analog subassemblies are given in Sections 5.2 and 5.3.

Section 5.4 gives instructions for troubleshooting on the digital subassemblies.

5.1 Disassembling the Instrument

> Note: The line filter and an additional noise-suppression capacitor are located below the rear panel plate drawn into the interior of the instrument. These components carry the AC supply voltage. Therefore, the IGA must be operated via an isolating transformer if repairs are to be performed inside the instrument.

a) Removing the cover

- Pull out the power connector.

  Note: Pulling the power connector does not switch off the IGA completely. Due to the built-in storage batteries the supply voltage remains connected to the data memories.

- Undo the four screws "a" (see Figs. 5-3 and 5-4).

- Lift the cover off and place it to the right of the instrument. In this case, it is not necessary to undo any connectors.

After folding the synthesizer board up, all the components on the motherboard are accessible.

Plug in the power connector and switch the instrument on again. None of the functions of the IGA is affected if the cover remains removed.

b) Removing the rear panel

- Pull out the power connector.
- Remove the cover (see under a)).
- Undo the four screws "b" (see Figs. 5-3 and 5-5).
- Withdraw the rear panel upwards from the multipoint connector.
- If required, disconnect cables X195 and X196 (power supply for motherboard), X201 (blower), X13 and X14 (if the IEC bus option is used).

Note:	If the battery cable X142 is unplugged, the stored data are lost. However, the length of the cable is such that the cable need not be disconnected for any repair required on the rear panel.

c) Removing the keyboard

- Pull out the power connector.
- Remove the cover (see under a)).
- Unplug cables W34 (+5 V), W33 (ground) W20, W21, W23 and, if the option IGA-B2 is used, W300 (on the cassette drive).

  To protect the components against destruction by static loading the connectors must be provided with special conducting sponge.
- Place the cover with its top on a support.
- An aluminium bracket is fixed on the lefthand and righthand sides of the keyboard rear. The complete keyboard is clamped into the cover with the aid of screws "c" (see Fig. 5-6). Undo the two screws.
- Undo the remaining 7 screws "d" of the keyboard.
- Withdraw the board upwards from the cover.
- If required, undo the connections W30, W31 and W32. To protect the components against destruction by static loading, the connectors must be provided with special conducting sponge.
- The covering plate of the keyboard can be withdrawn downwards from the instrument cover.

For assembling the instrument, proceed in the reverse order. Use the long screws for fixing the aluminium brackets. Tighten the two clamping screws only slightly.

d) Removing the display unit and the cassette drive
(with the option IGA-B2 fitted)

- Pull out the power connector.
- Remove the cover (see under a)).
- Unplug cables W34 (+5 V), W33 (ground), W20, W21, W23 and - with the cassette drive option fitted - W300 (on the cassette drive).
  To protect the components against destruction by static loading, the connectors must be provided with special conducting sponge.
- Place the cover with its top on a support.
- Display unit:
  Undo the three screws "e" and unplug cables W30, W31 and W32. Then the display unit can be removed. To protect the components, the connectors must also be provided with special conducting sponge.
- Cassette drive:
  Undo the four screws "f" and pull off the 6-pole sound head plug B.
  Withdraw the cassette drive downwards away from the cover.

For assembling proceed in the reverse order.

5.2 Faults in the Analog Subassemblies

5.2.1 Power Supply

The following symptoms may point to a defect in the power supply:

- None of the operating functions is possible.
  (The operating voltage is not attained, CPU reset or CEPF is faulty).
- Data output is not possible with the internal clock, the cassette unit does not operate (option B2).
  (The +12-V supply is not stable).
- A defined operating state is not obtained on loss of power or after switching the set on.
  (CPU reset or power-failure signal faulty).
- The contents of the output memory are lost after switching the set off.
  (Charging circuitry or RAM supply faulty, the power-failure signal does not appear, the storage batteries are defective).

5.2.1.1 Checking the Output Voltages

Note: The line filter and an additional noise-suppression capacitor are located below the rear panel plate drawn into the interior of the instrument. These components carry the AC supply voltage.

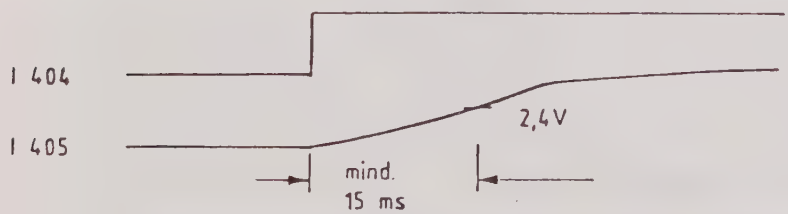
Therefore, the IGA must be operated via an isolating transformer if repairs are to be performed inside the instrument.

With the power on, measure the voltage referred to ground (X171) at the following points:

X161	+5.1 V ±2%
X90	+12 V ±5%
X92	max. 3.85 V (R201 turned fully anticlockwise) to min. 17.4 V (R201 turned fully clockwise)
I405, I404	> 2.4 V (TTL-level high)
I406	< 0,8 V
I407	≧ 2.4 V
I408	≧ 4.5 V with the instrument switched on, ≧ 2.2 V with the instrument switched off

Fig. 5-1 shows the timing of the voltages across the interfaces I404 to I406 when the IGA is switched on and off.

Switching on



Switching off

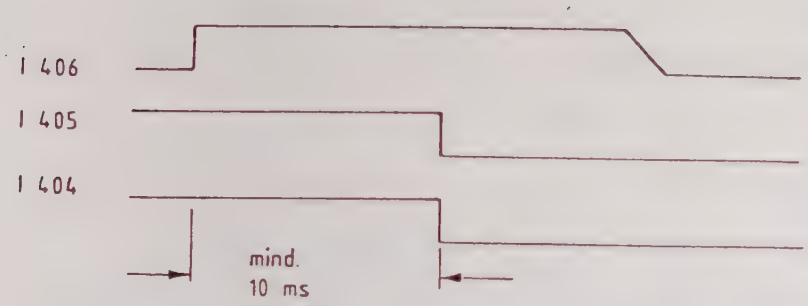


Fig. 5-1 Timing of voltages at interfaces I404 to I406

If the voltages are faulty, check the corresponding subassemblies in accordance with the circuit description. After unplugging connectors X90, X92 and X161, the outputs can be loaded as follows:

X90 ..... 300 mA
X92 ..... 500 mA
X160 ..... 6 A

If the power supply functions within the specified tolerances with an external load connected, the cause of the fault is overloading due to the internal circuitry.

5.2.1.2 Adjusting the TTL Operating Voltage

If the voltage across X161 slightly exceeds the tolerance specified above, it can be adjusted with the aid of R69 (turning the potentiometer clockwise increases the voltage).

Note:	If 5.5 V are exceed, the suppressor diode V27 may be destroyed. In this case the voltage breaks down.

Proceed as follows in this case:

- Switch the instrument off.
- Replace V27.
- Turn R69 fully anticlockwise.
- Switch the instrument on and adjust the voltage again.

5.2.1.3 Troubleshooting NFB

- Open the instrument.
- Pull out links X90, X92 and W38.
- Replace the power fuse (see Section 2.1.2).
- Switch the instrument on.
- If the power fuse blows again, check the suppressor diode V27, switching transistor V23, its driving circuit and all the components connected to the positive pole of C50. Eliminate any shortcircuit and exchange the damaged components if required.
- Turn R69 fully anticlockwise.
- Switch the instrument on and adjust the voltage across X161 to 5.1 V + 2% using R69.

If the power fuse does not blow, proceed as follows:

- Measure the output voltages in the open-circuit mode and check the load currents as listed in Section 5.2.1.1.
- If the specified tolerance is not observed, check the corresponding subassemblies.
- Replace the defective components.
- Check the power supply for correct functioning.

5.2.1.4 Troubleshooting in the Circuit Producing the Reset and the CEPF Signals

If with a correctly set +5-V supply RESET IN and CEPF are low, check output D400.2 and the divider voltages. The voltage at D401.8 can be slightly varied by turning R69. If it is below 4.75 V outputs D401.2 and D401.3 must be low, if the max. value of 4.9 V is exceeded they must be high.

If the RESET IN line alone remains low, check the power failure signal.

After eliminating a defect, the TTL supply voltage must be adjusted again.

5.2.1.5 Checking the Power Failure Signal

Reduce the AC input voltage of the IGA via a variable transformer until the voltage at the positive pole of C50 falls below +18 V. Then N10.4 must be low and N10.2 high. If required, replace the defective components.

5.3 Synthesizer

(See circuit diagram 344.0515 S)

a) Suspecting the CPU clock to be absent

The CPU clock can be suspected to be absent, in particular, if all operating functions are defunct.

The 6-MHz clock can be checked at pin X150.4.

b) Suspecting that the output clock is absent or wrong

This fault can especially be suspected if the data output is correct in the external clock mode but not in the internal clock mode.

The synthesizer is explained in detail in the circuit description. Troubleshooting should therefore be based on this description.

The following hints indicate the order in which it is best to proceed:

- Check whether the frequency entered cannot be observed at the synthesizer output X150, pin 7.
- Check the +5-V and +12-V supplies.
- Check the VCO output frequency at X150, pin 6. It should lie between 720 kHz and 1.8 MHz.

  If this is not the case, one of the dividers D5 to D8 probably does not operate correctly or one of the two multiplexers D9 or D11 selects the wrong divider output.
- It may also be possible that one of the dividers in the feedback loop (D70) divides by a wrong factor.

  If no squarewave signal appears at all, either the reference signal is absent or the phase comparator, the filter or the VCO are defective.
- Check whether the reference frequency (10 kHz) is present at the input of the phase comparator (D4.1).
- Check whether the frequency at the second input of the phase comparator is also 10 kHz.

  If this is not the case, then although the VCO delivers an output signal the VCO is not controlled correctly or the divider in the feedback loop (D70) is defective or set incorrectly.

5.4 Troubleshooting in Digital Section

Signature analysis has proved useful for troubleshooting in digital circuits; the Logic Generator IGA is a tool for use with this method.

The signature analyzer is connected to the IGA as follows:

- clock input to X36.3
- start input to X36.4
- stop input to X36.5
- ground to X36.1

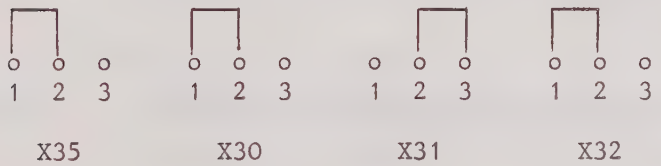
Switch the IGA off and set it to the test mode by changing the position of links X30 and X35 or X41 and X42 (for the position of the links see Fig. 5-5). X31 and X32 select the source for the clock, start and stop signals.

Three different test modes are possible; they should be used in the order mentioned.

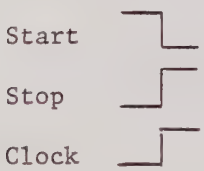
(For the position of the links during normal operation see Table 5-4).

5.4.1 First Test

- Switch the IGA off.
- Change the position of the links (see Fig. 5.5) to correspond to the diagram below.



- Set the signature analyzer as follows:



After switching the IGA on, the processor scans the complete address area and reads out all the chips. The data bus of the IGA is in this case separated from the data pins of the CPU (see section 4.1).

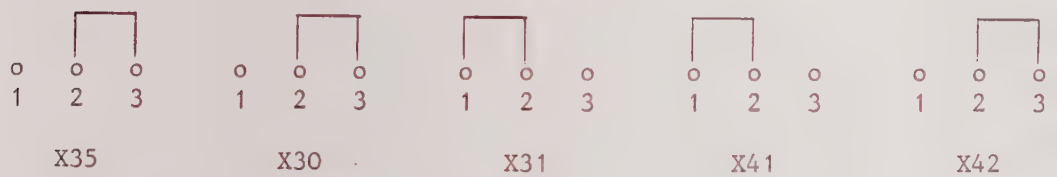
The test points listed in Table 5-1 are checked using the data probe of the signature analyzer and the signatures are compared with those given in the tables.

Due to the edges selected for the start and stop signals, the signature analyzer records the pattern only during the lower half of the address area. The coincidence of the recorded signatures and the values given in the tables shows that the CPU is functioning properly and the ROM contents are correct.

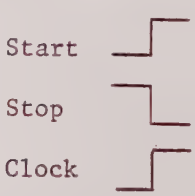
The upper half of the address area can be observed after selecting the edges of the start and stop signals on the signature analyzer as follows.

5.4.2 Second Test

- Switch the IGA off.
- Change the position of the links (see Fig. 5-5) to correspond to the diagram below.



- Set the signature analyzer as follows:



> Note: During this test, all the data stored are overwritten!
> The cassette drive (IGA-B2 should not contain any cassette.

After switching the IGA on, all the circuit functions of the IGA are cyclically addressed by the processor (written or read or written and read).

In the case of faulty signatures, check mainly the RD and WR lines.
Check also the supply voltage (see section 5.2.1).

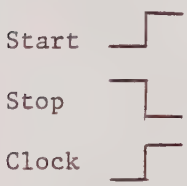
During the second test, for instance all the RAMs are checked. The signatures at the data pins of the output D119 to D126 (D123 to D126 with model 02) are valid only if the input of the signature analyzer is connected via a pull-up resistor (4.7 kΩ) to the 5-V supply.

Table 5-2 for the signatures of the second test is included in the appendix.

5.4.3 Third Test

- Switch the IGA off.
- Change the position of the links (see Fig. 5-5) to correspond to the diagram below:

- Set the signature analyzer as follows:



- Connect the clock input of the signature analyzer to R150 as shown below:

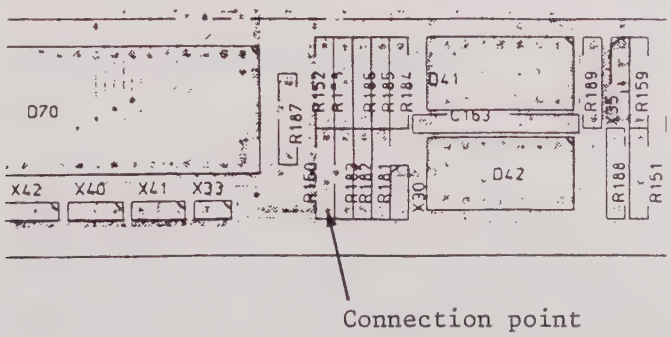


Fig. 5-2 Connection of clock input to R150

Note: During this test, all the data stored are overwritten.
The cassette drive (IGA-B2) should not contain any cassette.

The third test permits checking of the transceivers in the data bus if faulty signatures have occurred there during the second test. Except for the opcode fetch, only write cycles are executed. If faulty signatures appear on the data bus, the line transceivers or the associated driving circuits are defective.

The signatures at the data pins of the output-memory ICs are valid only if the input of the signature analyzer is connected to the 5-V supply via a pull-up resistor (approx. 4.7 kΩ).

The signatures for the third test are given in Table 5-3.

Table 5-1 Signatures for first test (lower address range)

Valid for software level Z-3

Measurement	Test-point	Signature					
		Fitted:					
		all EPROMs	only D60	only D61	only D62	only D63	only D64
D0	D32.18	642F	512H	7F63	U11P	U83H	4041
D1	D32.17	460A	3C88	5AH7	FU37	C20P	5A6F
D2	D32.16	678C	A21C	577C	02P5	8C09	1C07
D3	D32.15	52AC	4576	UPFU	C6H4	H434	8CU2
D4	D32.14	5F4U	C59U	095U	9HU7	77A8	0AH0
D5	D32.13	1P15	9FU7	F9HP	C00P	UHAA	0698
D6	D32.12	9837	0816	59H8	P654	A36A	1FF7
D7	D32.11	C51P	96F3	AF29	69A1	7HC2	9CP7
A0	D31.2	H335					
A1	D31.5	C113					
A2	D31.6	7050					
A3	D31.9	0772					
A4	D31.12	C4C3					
A5	D31.15	AA08					
A6	D31.16	7211					
A7	D31.19	A3C1					
A8	D50.21	7707					
A9	D50.22	577A					
A10	D50.23	HH86					
A11	D50.24	89F1					
A12	D50.25	AC99					
A13	D50.26	PCF3					
A14	D50.27	1180					

Chip Selects,
lower address range (EPROMs)

Test point	Signature
D34.15	FU4U
14	A207
13	H6A3
12	4U34
11	H24U
10	219C
9	1565
7	U731
D60.18	FU4U
D61.18	A207
D62.10	8267
D63.20	CU0P
D64.18	4244

Chip Selects,
upper address range

Test point	Signature
D35.1	4CP2
D35.2	U1U2
D35.3	P352
D35.4	340A
D35.5	8UH9
D35.6	2F25
D35.7	F615
D35.8	6F7P
D35.9	048A
D35.10	A39A
D35.11	0H59
D35.13	599H
D35.14	9970
D35.15	4947
D35.16	8H91
D35.17	0U2U

Table 5-2 Signatures for second test

Main board D70

Pin	Signature	Probe tip blinking
1	F181	no
2	F181	no
3	-	yes
4	0000	no
5	F181	no
6	F181	no
7	U475	yes
8	U475	yes
9	0000	yes
10	F181	yes
11	0000	yes
12	164F	yes
13	107H	yes
14	9UPU	yes
15	5H79	yes
16	HH14	yes
17	PF3A	yes
18	60H3	yes
19	4C59	yes
20	0000	no
21	P71F	yes
22	0CU0	yes
23	H29P	yes
24	A3FF	yes

Pin	Signature	Probe tip blinking
25	2507	yes
26	13A5	yes
27	32FH	yes
28	091F	yes
29	0000	no
30	F181	no
31	F181	no
32	-	yes
33	0000	no
34	0000	no
35	0000	no
36	0000	no
37	0000	no
38	0000	no
39	F181	no
40	F181	no

Main board D50

Pin	Signature	Probe tip blinking
1	0000	yes
2	0000	yes
3	0000	no
4	F181	yes
5	-	yes
6	0000	no
7	0000	yes
8	-	yes
9	0000	no
10	0000	no
11	F181	no
12	164F	yes
13	107H	yes
14	9UPU	yes
15	5H79	yes
16	HH14	yes
17	PF3A	yes
18	60H3	yes
19	4C59	yes
20	0000	no
21	8A6F	yes
22	1U0H	yes
23	274A	yes
24	CHA4	yes

Pin	Signature	Probe tip blinking
25	1533	yes
26	4317	yes
27	HCF1	yes
28	640P	yes
29	795C	yes
30	0000	yes
31	F181	yes
32	0000	yes
33	F181	yes
34	0000	no
35	F181	no
36	F181	no
37	F181	yes
38	0000	no
39	0000	no
40	F181	no

Pin	Signature	Probe tip blinking
1	F181	yes
2	AH9P	yes
3	F181	no
4	F181	no
5	35U4	yes
6	35U4	yes
7	0000	no
8	0000	yes
9	F181	no
10	0000	yes
11	F181	yes
12	0811	yes
13	640P	yes
14	F181	no

D41

Pin	Signature	Probe tip blinking
1	U475	yes
2	0811	yes
3	UF64	yes
4	6F1U	yes
5	F181	no
6	AH9P	yes
7	0000	no
8	35U4	yes
9	F181	yes
10	U475	yes
11	U475	yes
12	35U4	yes
13	35U4	yes
14	F181	no

D42

Pin	Signature	Probe tip blinking
1	UF64	yes
2	0000	yes
3	UF64	yes
4	35U4	yes
5	0000	yes
6	35U4	yes
7	0000	no
8	F181	no
9	F181	no
10	0000	yes
11	F181	no
12	F181	no
13	F181	no
14	F181	no

D37

Pin	Signature	Probe tip blinking
1	F181	yes
2	0000	yes
3	F181	no
4	0000	no
5	0000	no
6	F181	no
7	0000	no
8	0000	no
9	F181	no
10	0000	no
11	0000	no
12	0000	no
13	F181	no
14	F181	no

D40

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	no
3	F181	no
4	0000	no
5	35U4	yes
6	U475	yes
7	0000	no
8	F181	yes
9	0000	yes
10	6F1U	yes
11	AH9P	yes
12	A58U	yes
13	640P	yes
14	F181	no

D30

Pin	Signatue	Probe tip blinking
1	F181	no
2	0000	no
3	164F	yes
4	0000	yes
5	107H	yes
6	0000	no
7	9UPU	yes
8	0000	no
9	5H79	yes
10	0000	no
11	0000	no
12	HH14	yes
13	0000	no
14	PF3A	yes
15	0000	no
16	60H3	yes
17	0000	no
18	4C59	yes
19	F181	no
20	F181	no

D34

Pin	Signature	Probe tip blinking
1	1533	yes
2	U317	yes
3	HCF1	yes
4	640P	yes
5	640P	yes
6	F181	no
7	F181	no
8	0000	no
9	F181	no
10	F181	no
11	F181	no
12	F181	no
13	F181	no
14	F181	yes
15	F181	yes
16	F181	no

D84

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	no
3	F181	no
4	0000	no
5	F181	no
6	F181	no
7	0000	no
8	0000	no
9	0000	no
10	F181	no
11	F181	no
12	0000	no
13	F181	no
14	F181	no
15	0000	no
16	F181	no

D31

Pin	Signature	Probe tip blinking
1	F181	no
2	65UC	yes
3	164F	yes
4	107H	yes
5	P9FC	yes
6	0344	yes
7	9UPU	yes
8	5H79	yes
9	0U2H	yes
10	0000	no
11	F181	yes
12	7A1P	yes
13	4C43	yes
14	2P08	yes
15	883A	yes
16	HC0U	yes
17	3F3U	yes
18	80HH	yes
19	UUC1	yes
20	F181	no

D82

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	no
3	F181	no
4	0000	no
5	F181	no
6	F181	no
7	F181	no
8	0000	no
9	F181	no
10	F181	no
11	F181	no
12	0000	no
13	F181	no
14	F181	no
15	0000	no
16	F181	no

D81

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	no
3	F181	no
4	0000	no
5	F181	no
6	F181	no
7	F181	no
8	0000	no
9	0000	no
10	F181	no
11	F181	no
12	0000	no
13	F181	no
14	F181	no
15	0000	no
16	F181	no

D35

Pin	Signature	Probe tip blinking
1	U475	yes
2	AH9P	yes
3	9838	yes
4	U345	yes
5	7466	yes
6	5FC0	yes
7	F181	yes
8	F181	yes
9	F181	yes
10	F181	yes
11	F181	yes
12	0000	no
13	F181	yes
14	F181	yes
15	F181	yes
16	F181	yes
17	CUFU	yes
18	A58U	yes
19	A584	yes
20	HCF1	yes
21	U317	yes
22	1533	yes
23	CHA4	yes
24	F1d81	no

D83

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	no
3	F181	no
4	0000	no
5	F181	no
6	F181	no
7	0000	no
8	0000	no
9	0000	no
10	F181	no
11	F181	no
12	0000	no
13	F181	no
14	F181	no
15	0000	no
16	F181	no

D90

Pin	Signature	Probe tip blinking
1	0422	yes
2	F16H	yes
3	2HA3	yes
4	0U2H	yes
5	65UC	yes
6	P9FC	yes
7	0344	yes
8	AH9P	yes
9	0000	yes
10	F181	yes
11	682U	yes
12	C456	yes
13	107H	yes
14	51CU	yes
15	1U0H	yes
16	03FC	yes
17	UUC1	yes
18	F181	no

D91

Pin	Signature	Probe tip blinking
1	0422	yes
2	F16H	yes
3	2HA3	yes
4	0U2H	yes
5	65UC	yes
6	P9FC	yes
7	0344	yes
8	AH9P	yes
9	0000	yes
10	F181	yes
11	80HH	yes
12	3F3U	yes
13	2P08	yes
14	4C43	yes
15	1U0H	yes
16	03FC	yes
17	UUC1	yes
18	F181	no

D33

Pin	Signature	Probe tip blinking
1	UF64	yes
2	164F	yes
3	107H	yes
4	9UPU	yes
5	5H79	yes
6	HH14	yes
7	PF3H	yes
8	60H3	yes
9	4C59	yes
10	0000	no
11	4C59	yes
12	60H3	yes
13	PF3A	yes
14	HH14	yes
15	5H79	yes
16	P40H	yes
17	107H	yes
18	164F	yes
19	0000	yes
20	F181	no

D32

Pin	Signature	Probe tip blinking
1	3544	yes
2	51CU	yes
3	107H	yes
4	C456	yes
5	682U	yes
6	4C43	yes
7	2P08	yes
8	3F3U	yes
9	80HH	yes
10	0000	no
11	4C59	yes
12	60H3	yes
13	PF3H	yes
14	HH14	yes
15	5H79	yes
16	9UPU	yes
17	107H	yes
18	164F	yes
19	0000	yes
20	F181	no

D164

Pin	Signature	Probe tip blinking
1	5P3H	yes
2	F5PC	yes
3	U8C7	yes
4	H837	yes
5	C140	yes
6	1C50	yes
7	0000	no
8	7518	yes
9	C499	yes
10	F181	no
11	U8C7	yes
12	4370	yes
13	F181	no
14	F181	no

D167

Pin	Signature	Probe tip blinking
1	A408	yes
2	6589	yes
3	6589	yes
4	A408	yes
5	F181	no
6	0000	no
7	0000	no
8	F6A4	yes
9	0725	yes
10	0725	yes
11	F6A4	yes
12	F6A4	yes
13	0725	yes
14	F181	no

D172

Pin	Signature	Probe tip blinking
1	-	yes
2	-	yes
3	F181	no
4	-	yes
5	-	yes
6	F181	no
7	0000	no
8	-	yes
9	0000	yes
10	-	yes
11	5FC0	yes
12	0000	yes
13	5FC0	yes
14	F181	no

D165

Pin	Signature	Probe tip blinking
1	9871	yes
2	C140	yes
3	U8C7	yes
4	580H	yes
5	F6A4	yes
6	0725	yes
7	0000	no
8	4P35	yes
9	8UC4	yes
10	14A3	yes
11	U8C7	yes
12	0000	no
13	F181	no
14	F181	no

D170

Pin	Signature	Probe tip blinking
1	0000	no
2	H903	yes
3	F181	no
4	F181	yes
5	0000	yes
6	F181	yes
7	F181	yes
8	0000	no
9	0000	yes
10	5P3H	yes
11	F181	no
12	F181	yes
13	0000	yes
14	F181	yes
15	F181	yes
16	F181	no

D171

Pin	Signature	Probe tip blinking
1	-	yes
2	-	yes
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	0000	no
8	-	yes
9	-	yes
10	-	yes
11	-	yes
12	F181	no
13	-	yes
14	F181	no

D173

Pin	Signature	Probe tip blinking
1	0000	yes
2	FAPU	yes
3	0000	yes
4	0000	yes
5	FAPU	yes
6	0000	yes
7	0000	no
8	1527	yes
9	934P	yes
10	47P8	yes
11	-	yes
12	0C6P	yes
13	-	yes
14	F181	no

D151

Pin	Signature	Probe tip blinking
1	0000	no
2	-	yes
3	F181	no
4	-	yes
5	-	yes
6	0000	yes
7	F181	yes
8	0000	no
9	0000	no
10	-	yes
11	F181	no
12	-	yes
13	-	yes
14	0000	yes
15	-	yes
16	F181	no

D179

Pin	Signature	Probe tip blinking
1	CUFU	yes
2	65UC	yes
3	P9FC	yes
4	F181	no
5	F42H	yes
6	9C4F	yes
7	P0AP	yes
8	0000	no
9	F181	no
10	F181	no
11	F181	no
12	F181	no
13	F181	yes
14	F181	yes
15	F181	yes
16	F181	no

D157

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	yes
3	0000	yes
4	0000	no
5	AH21	yes
6	AH21	yes
7	0000	no
8	F181	no
9	F181	no
10	F181	no
11	F181	no
12	F181	no
13	F181	no
14	F181	no

D118

Pin	Signature	Probe tip blinking
1	C499	yes
2	7518	yes
3	046A	yes
4	F5PC	yes
5	7518	yes
6	C499	yes
7	0000	no
8	7518	yes
9	C499	yes
10	C499	yes
11	7518	yes
12	A65A	yes
13	67HC	yes
14	F181	no

D112

Pin	Signature	Probe tip blinking
1	67HC	yes
2	8H67	yes
3	1F80	yes
4	PHC7	yes
5	1U0H	yes
6	8124	yes
7	1U0H	yes
8	0000	no
9	F181	no
10	F181	yes
11	F181	yes
12	F181	no
13	F181	yes
14	0000	yes
15	0000	no
16	F181	no

D115

Pin	Signature	Probe tip blinking
1	F181	no
2	UAPA	yes
3	3C6C	yes
4	F181	no
5	4U0H	yes
6	8P8F	yes
7	0000	no
8	62H2	yes
9	A353	yes
10	F181	no
11	09AU	yes
12	F82P	yes
13	F181	no
14	F181	no

D114

Pin	Signature	Probe tip blinking
1	3C6C	yes
2	5FC0	yes
3	UAPA	yes
4	3C6C	yes
5	7466	yes
6	4U0H	yes
7	0000	no
8	F82P	yes
9	U345	yes
10	3C6C	yes
11	A353	yes
12	9838	yes
13	3C6C	yes
14	F181	no

D113

Pin	Signature	Probe tip blinking
1	UAPA	yes
2	UAPA	yes
3	3C6C	yes
4	A65A	yes
5	5FC0	yes
6	UAPA	yes
7	0000	no
8	67HC	yes
9	A65A	yes
10	F181	yes
11	F181	yes
12	F181	yes
13	0000	yes
14	F181	no

D135

Pin	Signature	Probe tip blinking
1	423U	yes
2	C7U7	yes
3	A617	yes
4	F181	no
5	F181	no
6	F181	no
7	0000	no
8	F181	yes
9	F181	yes
10	CUFU	yes
11	CUFU	yes
12	CUFU	yes
13	0000	yes
14	F181	no

D117

Pin	Signature	Probe tip blinking
1	67HC	yes
2	5FC0	yes
3	5FC0	yes
4	67HC	yes
5	7466	yes
6	7466	yes
7	0000	no
8	U345	yes
9	U345	yes
10	67HC	yes
11	9838	yes
12	9838	yes
13	67HC	yes
14	F181	no

D116

Pin	Signature	Probe tip blinking
1	67HC	yes
2	F181	yes
3	F181	yes
4	5FC0	yes
5	6U2H	yes
6	5FC0	yes
7	0000	no
8	423U	yes
9	-	yes
10	363F	yes
11	C7U7	yes
12	F413	yes
13	UH0P	yes
14	F181	no

D131

Pin	Signature	Probe tip blinking
1	F181	no
2	34C4	yes
3	3009	yes
4	6U59	yes
5	3C36	yes
6	PHP7	yes
7	A005	yes
8	63AH	yes
9	UP71	yes
10	0000	no
11	U8C7	yes
12	F866	yes
13	F2H4	yes
14	F2UC	yes
15	8056	yes
16	4391	yes
17	UH94	yes
18	4HCA	yes
19	AP5P	yes
20	F181	no

D133

Pin	Signature	Probe tip blinking
1	F181	no
2	8H2H	yes
3	U4A4	yes
4	UU80	yes
5	82AU	yes
6	547P	yes
7	PCCU	yes
8	885P	yes
9	47P8	yes
10	0000	no
11	U8C7	yes
12	71UU	yes
13	UH0P	yes
14	F413	yes
15	39FU	yes
16	UA08	yes
17	363F	yes
18	P29U	yes
19	17F7	yes
20	F181	no

D127

Pin	Signature	Probe tip blinking
1	F181	no
2	34C4	yes
3	H883	yes
4	P1UC	yes
5	3C36	yes
6	PHP7	yes
7	PU31	yes
8	75H1	yes
9	UP71	yes
10	0000	no
11	U8C7	yes
12	F866	yes
13	56CC	yes
14	4C3H	yes
15	8056	yes
16	4391	yes
17	5P9H	yes
18	5F3U	yes
19	AP5P	yes
20	F181	no

D129

Pin	Signature	Probe tip blinking
1	F181	no
2	34C4	yes
3	4H34	yes
4	UPP2	yes
5	3C36	yes
6	PHP7	yes
7	3P3U	yes
8	P0A0	yes
9	UP71	yes
10	0000	no
11	U8C7	yes
12	F866	yes
13	1H17	yes
14	UA31	yes
15	8056	yes
16	4391	yes
17	FH07	yes
18	9345	yes
19	AP5P	yes
20	F181	no

D106

Pin	Signature	Probe tip blinking
1	F181	no
2	HFP4	yes
3	164F	yes
4	107H	yes
5	60H3	yes
6	9FF8	yes
7	P40H	yes
8	5H79	yes
9	690C	yes
10	0000	no
11	F181	yes
12	A5A8	yes
13	HH14	yes
14	PF3A	yes
15	A6C9	yes
16	P6HF	yes
17	3F3U	yes
18	4459	yes
19	48P4	yes
20	F181	no

D108

Pin	Signature	Probe tip blinking
1	F42H	yes
2	1P75	yes
3	4459	yes
4	8309	yes
5	3F3U	yes
6	76HA	yes
7	PF3A	yes
8	748F	yes
9	HH14	yes
10	0000	no
11	6C00	yes
12	5H79	yes
13	UCCU	yes
14	P40H	yes
15	2UA9	yes
16	107H	yes
17	60H3	yes
18	164F	yes
19	F42H	yes
20	F181	no

D132

Pin	Signature	Probe tip blinking
1	0000	yes
2	164F	yes
3	107H	yes
4	P40H	yes
5	5H79	yes
6	HH14	yes
7	PF3A	yes
8	60H3	yes
9	4459	yes
10	0000	no
11	4HCA	yes
12	UH94	yes
13	F2UC	yes
14	F2H4	yes
15	63AH	yes
16	A005	yes
17	6U59	yes
18	3009	yes
19	7466	yes
20	F181	no

D134

Pin	Signature	Probe tip blinking
1	0000	yes
2	164F	yes
3	107H	yes
4	P40H	yes
5	5H79	yes
6	HH14	yes
7	PF3A	yes
8	60H3	yes
9	4459	yes
10	0000	no
11	-	yes
12	363F	yes
13	F413	yes
14	UH0P	yes
15	885P	yes
16	PCCU	yes
17	UU80	yes
18	U4A4	yes
19	5FC0	yes
20	F181	no

D128

Pin	Signature	Probe tip blinking
1	0000	yes
2	164F	yes
3	107H	yes
4	P40H	yes
5	5H79	yes
6	HH14	yes
7	PF3A	yes
8	60H3	yes
9	4459	yes
10	0000	no
11	HU01	yes
12	5P9H	yes
13	4C3H	yes
14	56CC	yes
15	75H1	yes
16	PU31	yes
17	P1UC	yes
18	H883	yes
19	9838	yes
20	F181	no

D130

Pin	Signature	Probe tip blinking
1	0000	yes
2	164F	yes
3	107H	yes
4	P40H	yes
5	5H79	yes
6	HH14	yes
7	PF3A	yes
8	60H3	yes
9	4459	yes
10	0000	no
11	9345	yes
12	FH07	yes
13	UA31	yes
14	1H17	yes
15	P0A0	yes
16	3P3U	yes
17	UPP2	yes
18	4H34	yes
19	U345	yes
20	F181	no

D101

Pin	Signature	Probe tip blinking
1	48P4	yes
2	1311	yes
3	0UAH	yes
4	HH3H	yes
5	0966	yes
6	668C	yes
7	AP6F	yes
8	0000	no
9	A5A8	yes
10	6C00	yes
11	A6C9	yes
12	UCCU	yes
13	2UA9	yes
14	P6HF	yes
15	A3F4	yes
16	F181	no

D104

Pin	Signature	Probe tip blinking
1	09F1	yes
2	U8C7	yes
3	0000	no
4	0000	no
5	0000	no
6	0000	no
7	0741	yes
8	0000	no
9	CAH3	yes
10	0741	yes
11	A3F4	yes
12	2UA9	yes
13	UCCU	yes
14	6C00	yes
15	P1PU	yes
16	F181	no

D100

Pin	Signature	Probe tip blinking
1	690C	yes
2	AP6F	yes
3	668C	yes
4	0966	yes
5	47CC	yes
6	CPC9	yes
7	3883	yes
8	0000	no
9	HFP4	yes
10	1P75	yes
11	HPU2	yes
12	8309	yes
13	76HA	yes
14	9FF8	yes
15	748F	yes
16	F181	no

D103

Pin	Signature	Probe tip blinking
1	09F1	yes
2	U8C7	yes
3	0000	no
4	0000	no
5	0000	no
6	0000	no
7	046A	yes
8	0000	no
9	CAH3	yes
10	046A	yes
11	748F	yes
12	76HA	yes
13	8309	yes
14	1P75	yes
15	0741	yes
16	F181	no

D111

Pin	Signature	Probe tip blinking
1	67HC	yes
2	7A1P	yes
3	6C00	yes
4	4C84	yes
5	883A	yes
6	UCCU	yes
7	F091	yes
8	0000	no
9	0P89	yes
10	A3F4	yes
11	UUC1	yes
12	0422	yes
13	2UA9	yes
14	HC0U	yes
15	0000	no
16	F181	no

D110

Pin	Signature	Probe tip blinking
1	67HC	yes
2	65UC	yes
3	1P75	yes
4	2F6U	yes
5	P9FC	yes
6	8309	yes
7	4963	yes
8	0000	no
9	U234	yes
10	748F	yes
11	0U2H	yes
12	5A1U	yes
13	76HA	yes
14	0344	yes
15	0000	no
16	F181	no

D107

Pin	Signature	Probe tip blinking
1	F181	no
2	1155	yes
3	H0H4	yes
4	51CU	yes
5	107H	yes
6	7P5H	yes
7	CUHF	yes
8	0000	no
9	F181	yes
10	F181	no
11	0000	no
12	0000	no
13	0000	no
14	0000	no
15	F181	no
16	F181	no

D109

Pin	Signature	Probe tip blinking
1	9C4F	yes
2	1F80	yes
3	164F	yes
4	9C4F	yes
5	8124	yes
6	107H	yes
7	0000	no
8	164F	yes
9	01CP	yes
10	P0AP	yes
11	107H	yes
12	F6A4	yes
13	P0AP	yes
14	F181	no

D105

Pin	Signature	Probe tip blinking
1	09F1	yes
2	U8C7	yes
3	0000	no
4	0000	no
5	0000	no
6	0000	no
7	P1PU	yes
8	0000	no
9	CAH3	yes
10	P1PU	yes
11	PP74	yes
12	HAP1	yes
13	8124	yes
14	1F80	yes
15	0000	no
16	F181	no

D102

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	yes
3	F181	no
4	F181	yes
5	HH3H	yes
6	0UAH	yes
7	1311	yes
8	0000	no
9	1155	yes
10	1F80	yes
11	CUHF	yes
12	8124	yes
13	0000	no
14	0000	no
15	0000	no
16	F181	no

D177

Pin	Signature	Probe tip blinking
1	F181	no
2	6U2H	yes
3	4459	yes
4	60H3	yes
5	FH32	yes
6	67HC	yes
7	PF3A	yes
8	HH14	yes
9	U0A7	yes
10	0000	no
11	F181	yes
12	9871	yes
13	5H79	yes
14	P40H	yes
15	934P	yes
16	580H	yes
17	107H	yes
18	164F	yes
19	OUP6	yes
20	F181	no

D178

Pin	Signature	Probe tip blinking
1	65UC	yes
2	P9FC	yes
3	A6FC	yes
4	F181	yes
5	F181	yes
6	F181	no
7	F181	no
8	0000	no
9	F181	no
10	F181	no
11	F181	yes
12	F181	yes
13	F181	yes
14	F181	yes
15	F181	yes
16	F181	no

D175

Pin	Signature	Probe tip blinking
1	F181	no
2	AH21	yes
3	4459	yes
4	60H3	yes
5	0C6P	yes
6	433H	yes
7	PF3A	yes
8	HH14	yes
9	1F16	yes
10	0000	no
11	F181	yes
12	22P4	yes
13	5H79	yes
14	P40H	yes
15	3C13	yes
16	FUU2	yes
17	107H	yes
18	164F	yes
19	A96A	yes
20	F181	no

D176

Pin	Signature	Probe tip blinking
1	F181	no
2	HF38	yes
3	4459	yes
4	60H3	yes
5	2C99	yes
6	1957	yes
7	PF3A	yes
8	HH14	yes
9	078H	yes
10	0000	no
11	F181	yes
12	H837	yes
13	5H79	yes
14	P40H	yes
15	5P3H	yes
16	14A3	yes
17	107H	yes
18	164F	yes
19	09F1	yes
20	F181	no

D168

Pin	Signature	Probe tip blinking
1	CC1A	yes
2	AH50	yes
3	71UU	yes
4	6672	yes
5	C4A7	yes
6	39FU	yes
7	611C	yes
8	0000	no
9	4CF6	yes
10	UA08	yes
11	4046	yes
12	04PH	yes
13	17F7	yes
14	26HP	yes
15	7518	yes
16	F181	no

D169

Pin	Signature	Probe tip blinking
1	8UC4	yes
2	22P4	yes
3	F181	no
4	AH50	yes
5	3C13	yes
6	F181	no
7	C4A7	yes
8	0000	no
9	4046	yes
10	F181	no
11	FUU2	yes
12	26HP	yes
13	F181	no
14	A96A	yes
15	0000	no
16	F181	no

D163

Pin	Signature	Probe tip blinking
1	HF38	yes
2	0000	no
3	078H	yes
4	1957	yes
5	AAU1	yes
6	6C70	yes
7	0000	no
8	3936	yes
9	U8C7	yes
10	F181	no
11	5FC0	yes
12	F181	no
13	FH32	yes
14	F181	no

D174

Pin	Signature	Probe tip blinking
1	1C50	yes
2	HAH1	yes
3	HAH1	yes
4	1C50	yes
5	0000	yes
6	F181	yes
7	0000	no
8	HAH1	yes
9	1C50	yes
10	1C50	yes
11	HAH1	yes
12	FAPU	yes
13	0C6P	yes
14	F181	no

D159

Pin	Signature	Probe tip blinking
1	4P35	yes
2	7518	yes
3	7518	yes
4	0000	no
5	-	yes
6	0000	no
7	0000	no
8	CC1A	yes
9	0725	yes
10	4P35	yes
11	H903	yes
12	U8C7	yes
13	1C50	yes
14	F181	no

D166

Pin	Signature	Probe tip blinking
1	A617	yes
2	433H	yes
3	4370	yes
4	1F16	yes
5	C140	yes
6	0000	no
7	0000	no
8	-	yes
9	0C6P	yes
10	-	yes
11	4P35	yes
12	F181	no
13	4P35	yes
14	F181	no

D160

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	F181	no
4	F181	no
5	F181	no
6	0000	no
7	0000	no
8	-	yes
9	F181	no
10	F181	no
11	-	yes
12	F181	no
13	-	yes
14	F181	no

D155

Pin	Signature	Probe tip blinking
1	-	yes
2	0725	yes
3	-	yes
4	CPC9	yes
5	3126	yes
6	046A	yes
7	0000	no
8	CAH3	yes
9	U0A7	yes
10	CPC9	yes
11	0000	no
12	0000	yes
13	F181	no
14	F181	yes

D162

Pin	Signature	Probe tip blinking
1	HF38	yes
2	F181	no
3	2C99	yes
4	F181	no
5	01CP	yes
6	F03U	yes
7	0000	no
8	F181	no
9	0000	no
10	F181	no
11	-	yes
12	01CP	yes
13	0000	no
14	F181	no

D161

Pin	Signature	Probe tip blinking
1	F181	no
2	6C70	yes
3	F181	no
4	0000	yes
5	-	yes
6	-	yes
7	0000	no
8	U8C7	yes
9	U8C7	yes
10	0000	no
11	4370	yes
12	0000	no
13	4370	yes
14	F181	no

D156

Pin	Signature	Probe tip blinking
1	F181	no
2	AH21	yes
3	AH21	yes
4	01CP	yes
5	F181	yes
6	01CP	yes
7	0000	no
8	F181	yes
9	F181	no
10	F181	yes
11	HF38	yes
12	F181	yes
13	HF38	yes
14	F181	no

D158

Pin	Signature	Probe tip blinking
1	-	yes
2	-	yes
3	F181	no
4	-	yes
5	-	yes
6	-	yes
7	0000	no
8	0000	no
9	0000	no
10	0C6P	yes
11	AH21	yes
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D154

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	0000	no
4	6589	yes
5	A408	yes
6	A408	yes
7	0000	no
8	F181	no
9	6589	yes
10	A408	yes
11	0725	yes
12	F6A4	yes
13	0000	yes
14	F181	no

D153

Pin	Signature	Probe tip blinking
1	A408	yes
2	-	yes
3	-	yes
4	F03U	yes
5	01CP	yes
6	F181	no
7	0000	no
8	F03U	yes
9	-	yes
10	01CP	yes
11	-	yes
12	-	yes
13	F03U	yes
14	F181	no

D150

Pin	Signature	Probe tip blinking
1	0725	yes
2	F181	no
3	0725	yes
4	-	yes
5	F181	no
6	-	yes
7	0000	no
8	A408	yes
9	0725	yes
10	AH21	yes
11	0000	no
12	0000	no
13	6FA0	yes
14	F181	no

D152

Pin	Signature	Probe tip blinking
1	01CP	yes
2	F03U	yes
3	F03U	yes
4	01CP	yes
5	01CP	yes
6	0000	no
7	0000	no
8	6FA0	yes
9	AH21	yes
10	0000	no
11	0000	yes
12	3126	yes
13	U0A7	yes
14	F181	no

D119 (with 4.7-kΩ pull-up resistor) D120

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	62H6	yes
9	0000	no
10	F181	yes
11	CC35	yes
12	3C4A	yes
13	1H70	yes
14	2H3H	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	62H6	yes
9	0000	no
10	F181	yes
11	1H2H	yes
12	F12U	yes
13	H68H	yes
14	7293	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

D121 (with 4.7-kΩ pull-up resistor) D122

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	09AU	yes
9	0000	no
10	F181	yes
11	U154	yes
12	37F6	yes
13	8613	yes
14	2P6A	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	09AU	yes
9	0000	no
10	F181	yes
11	460U	yes
12	0UHU	yes
13	5C39	yes
14	FA20	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

D123 (with 4.7-kΩ pull-up resistor) D124

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	8P8F	yes
9	0000	no
10	F181	yes
11	FP5H	yes
12	4P4H	yes
13	5272	yes
14	204A	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	8P8F	yes
9	0000	no
10	F181	yes
11	U2FP	yes
12	8U57	yes
13	F33U	yes
14	PC7U	yes
15	1U0H	yes
16	PHC7	yes
17	0P89	yes
18	F181	no

D125 (with 4.7-kΩ pull-up resistor) D126

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	3C6C	yes
9	0000	no
10	F181	yes
11	CF08	yes
12	7AP0	yes
13	2H23	yes
14	4297	yes
15	1U0H	yes
16	PHC7	yes
17	UP89	yes
18	F181	no

Pin	Signature	Probe tip blinking
1	0422	yes
2	F091	yes
3	4C84	yes
4	U234	yes
5	2F6U	yes
6	4963	yes
7	5A1U	yes
8	3C6C	yes
9	0000	no
10	F181	yes
11	5UH6	yes
12	6426	yes
13	68A3	yes
14	06AA	yes
15	1U0H	yes
16	PHC7	yes
17	UP89	yes
18	F181	no

Tape-Interface: D304

Pin	Signature	Probe tip blinking
1	F181	no
2	4FU4	yes
3	8H75	yes
4	20H9	yes
5	F181	no
6	P158	yes
7	0000	yes
8	2894	yes
9	F181	no
10	P915	yes
11	0000	yes
12	F181	yes
13	F181	yes
14	F181	no

D302

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	P40H	yes
4	-	yes
5	107H	yes
6	-	yes
7	164F	yes
8	F181	yes
9	5H79	yes
10	0000	no
11	0000	no
12	F181	no
13	F181	no
14	-	yes
15	0000	no
16	-	yes
17	0000	no
18	0000	no
19	0000	no
20	F181	no

D303

Pin	Signature	Probe tip blinking
1	F181	no
2	0000	no
3	0000	no
4	0000	no
5	0000	no
6	F181	no
7	F181	no
8	0000	no
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	F181	no
14	F181	yes
15	0000	no
16	0000	no

D300

Pin	Signature	Probe tip blinking
1	0000	no
2	F181	yes
3	F181	yes
4	F181	yes
5	0000	yes
6	0000	yes
7	0000	no
8	0000	yes
9	F181	yes
10	0000	no
11	0000	no
12	0000	no
13	F181	no
14	F181	no

D301

Pin	Signature	Probe tip blinking
1	F181	no
2	F181	yes
3	164F	yes
4	107H	yes
5	P40H	yes
6	0000	no
7	0000	no
8	0000	no
9	0000	no
10	0000	no
11	F181	no
12	P915	yes
13	20H9	yes
14	4FU4	yes
15	0000	no
16	F181	no

Synthesizer: D11

Pin	Signature	Probe tip blinking
1	0000	no
2	-	yes
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	0000	no
8	0000	no
9	0000	no
10	2C79	yes
11	4079	yes
12	0000	no
13	0000	no
14	0000	no
15	0000	no
16	F181	no

D9

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	0000	no
8	0000	no
9	9UU2	yes
10	83FH	yes
11	AF52	yes
12	0000	no
13	-	yes
14	-	yes
15	-	yes
16	F181	no

D10

Pin	Signature	Probe tip blinking
1	0000	no
2	AF52	yes
3	164F	yes
4	107H	yes
5	83FH	yes
6	9UU2	yes
7	P404	yes
8	5H79	yes
9	4079	yes
10	0000	no
11	0000	yes
12	2C79	yes
13	HH14	yes
14	0000	no
15	0000	no
16	0000	no
17	0000	no
18	0000	no
19	0000	no
20	F181	no

D7

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	-	yes
8	0000	no
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D8

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	-	yes
8	0000	no
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D5

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	0000	no
4	-	yes
5	-	yes
6	F181	no
7	0000	no
8	-	yes
9	-	yes
10	-	yes
11	-	yes
12	0000	no
13	0000	no
14	F181	no

D6

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	-	yes
8	0000	no
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D3

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	-	yes
8	0000	no
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D4

Pin	Signature	Probe tip blinking
1	-	yes
2	F181	no
3	F181	no
4	0000	no
5	0000	no
6	-	yes
7	0000	no
8	0000	no
9	0000	no
10	0000	no
11	F181	no
12	F181	no
13	0000	no
14	F181	no

D1

Pin	Signature	Probe tip blinking
1	F181	yes
2	0000	yes
3	0000	yes
4	0000	yes
5	0000	yes
6	0000	yes
7	0000	no
8	F181	yes
9	F181	yes
10	0000	yes
11	F181	no
12	F181	yes
13	0000	yes
14	F181	no

D2

Pin	Signature	Probe tip blinking
1	F181	yes
2	F181	no
3	F181	no
4	F181	no
5	F181	no
6	F181	no
7	0000	no
8	-	yes
9	-	yes
10	0000	no
11	-	yes
12	0000	no
13	0000	no
14	F181	no

D12 Keyboard: D13

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	F181	no
4	F181	no
5	F181	no
6	F181	no
7	0000	no
8	F181	no
9	F181	no
10	F181	yes
11	F181	yes
12	F181	yes
13	F181	no

Pin	Signature	Probe tip blinking
1	F181	yes
2	F181	yes
3	F181	yes
4	F181	no
5	F181	no
6	F181	no
7	0000	no
8	F181	no
9	F181	no
10	F181	no
11	F181	yes
12	F181	yes
13	F181	yes
14	F181	no

D10

Pin	Signature	Probe tip blinking
1	H29P	yes
2	1310	yes
3	A3FF	yes
4	624H	yes
5	32FH	yes
6	U34F	yes
7	0000	no
8	F89H	yes
9	091F	yes
10	H224	yes
11	13A5	yes
12	P486	yes
13	2507	yes
14	F181	no

D11

Pin	Signature	Probe tip blinking
1	0000	no
2	P71F	yes
3	0CU0	yes
4	65UC	yes
5	AU8A	yes
6	4366	yes
7	4896	yes
8	0000	no
9	F181	yes
10	F181	yes
11	F181	yes
12	F181	yes
13	F181	yes
14	65UC	yes
15	F181	yes
16	F181	no

D6

Pin	Signature	Probe tip blinking
1	A520	yes
2	64A1	yes
3	1A7P	yes
4	HCUU	yes
5	7054	yes
6	C1H5	yes
7	0000	no
8	4862	yes
9	89P3	yes
10	PC0C	yes
11	2A8A	yes
12	1415	yes
13	H594	yes
14	F181	no

D7

Pin	Signature	Probe tip blinking
1	F756	yes
2	06H7	yes
3	0CAC	yes
4	0000	yes
5	28A5	yes
6	P924	yes
7	0000	no
8	4CP2	yes
9	8A63	yes
10	472H	yes
11	86AF	yes
12	4906	yes
13	8887	yes
14	F181	no

D4

Pin	Signature	Probe tip blinking
1	F181	no
2	28A5	yes
3	4459	yes
4	60H3	yes
5	8A63	yes
6	86AF	yes
7	PF3A	yes
8	HH14	yes
9	8887	yes
10	0000	no
11	F181	no
12	9P91	yes
13	5H79	yes
14	P40H	yes
15	F37C	yes
16	U4PC	yes
17	107H	yes
18	164F	yes
19	4F1F	yes
20	F181	no

D5

Pin	Signature	Probe tip blinking
1	65UC	yes
2	65UC	yes
3	AU8A	yes
4	AU8A	yes
5	4366	yes
6	4366	yes
7	0000	no
8	4896	yes
9	4896	yes
10	F181	no
11	F181	no
12	F181	no
13	F181	no
14	F181	no

D2

Pin	Signature	Probe tip blinking
1	-	yes
2	0000	no
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	-	yes
8	0000	no
9	0000	no
10	0000	no
11	0000	no
12	-	yes
13	-	yes
14	0000	no
15	-	yes
16	F181	no

D3

Pin	Signature	Probe tip blinking
1	F181	no
2	A520	yes
3	4459	yes
4	60H3	yes
5	1A7P	yes
6	7054	yes
7	PF3A	yes
8	HH14	yes
9	89P3	yes
10	0000	no
11	F181	yes
12	28A8	yes
13	5H79	yes
14	P40H	yes
15	H594	yes
16	F756	yes
17	107H	yes
18	164F	yes
19	0CAC	yes
20	F181	no

Pin	Signature	Probe tip blinking
1	F181	no
2	F181	no
3	0000	yes
4	0000	no
5	F181	no
6	F181	no
7	F181	no
8	F181	no
9	0000	no
10	0000	yes
11	F181	yes
12	164F	yes
13	107H	yes
14	P40H	yes
15	5H79	yes
16	HH14	yes
17	PF3A	yes
18	60H3	yes
19	4459	yes
20	0000	no
21	65UC	yes
22	F181	yes
23	-	yes
24	-	yes

Pin	Signature	Probe tip blinking
25	-	yes
26	-	yes
27	-	yes
28	-	yes
29	-	yes
30	-	yes
31	-	yes
32	-	yes
33	-	yes
34	-	yes
35	-	yes
36	0000	no
37	0000	no
38	F181	no
39	F181	no
40	F181	no

Connector panel: D205

Pin	Signature	Probe tip blinking
1		
2		
3	A7U3	yes
4		
5	A09A	yes
6		
7	8A47	yes
8		
9	F56F	yes
10		
11		
12	H4A6	yes
13		
14	-	yes
15		
16	-	yes
17		
18	F03U	yes

D203

Pin	Signature	Probe tip blinking
1		
2		
3	6UHU	yes
4		
5	8210	yes
6		
7	41H7	yes
8		
9	09P7	yes
10		
11		
12	3UU0	yes
13		
14	2F66	yes
15		
16	UAC7	yes
17		
18	U535	yes

D204

Pin	Signature	Probe tip blinking
1		
2		
3	H646	yes
4		
5	3C89	yes
6		
7	U84P	yes
8		
9	C07P	yes
10		
11		
12	8669	yes
13		
14	95UU	yes
15		
16	432P	yes
17		
18	4FAF	yes

D201

Pin	Signature	Probe tip blinking
1		
2		
3	6UHU	yes
4		
5	8210	yes
6		
7	41H7	yes
8		
9	09P7	yes
10		
11		
12	3UU0	yes
13		
14	2F66	yes
15		
16	UAC7	yes
17		
18	U535	yes

D202

Pin	Signature	Probe tip blinking
1		
2		
3	6UHU	yes
4		
5	8210	yes
6		
7	41H7	yes
8		
9	09P7	yes
10		
11		
12	3UU0	yes
13		
14	2F66	yes
15		
16	UAC7	yes
17		
18	U535	yes

Display unit: D64

Pin	Signature	Probe tip blinking
1	0000	no
2	-	-
3	65UC	yes
4	-	-
5	-	yes
6	P9FC	yes
7	-	yes
8	-	-
9	-	yes
10	0344	yes
11	-	yes
12	-	-
13	0U2H	yes
14	-	yes
15	-	yes
16	F181	no

D62

Pin	Signature	Probe tip blinking
1	-	yes
2	-	yes
3	-	yes
4	-	yes
5	-	yes
6	-	yes
7	0000	no
8	-	yes
9	-	yes
10	0000	yes
11	F181	yes
12	-	yes
13	.	yes
14	F181	no

D63

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	0000	no
4	-	yes
5	-	yes
6	F181	no
7	0000	no
8	-	yes
9	-	yes
10	-	yes
11	-	yes
12	0000	no
13	F181	no
14	F181	no

Connector: V21

Pin	Signature	Probe tip blinking
1	H29P	yes
2	A3FF	yes
3	2507	yes
4	13A5	yes
5	32FH	yes
6	091F	yes
7	P71F	yes
8	0CU0	yes
9	F181	yes
10	P9FC	yes
11	0344	yes
12	OU2H	yes
13	F181	yes
14	F181	yes
15	P0PC	yes
16	H29P	yes

W23

Pin	Signature	Probe tip blinking
1	0000	no
2	0000	no
3	0000	no
4	0000	no
5	0000	no
6	0000	no
7	0000	no
8	0000	no
9	0000	no
10	0000	yes
11	0000	no
12	F181	yes
13	0000	yes
14	F191	yes
15	65UC	yes
16	0000	no

W20

Pin	Signature	Probe tip blinking
1	164F	yes
2	107H	yes
3	P40H	yes
4	5H79	yes
5	HH14	yes
6	PF3A	yes
7	60H3	yes
8	4459	yes
9	-	yes
10	-	yes
11	-	yes
12	-	yes
13	-	yes
14	-	yes
15	-	yes

Table 5-3 Signatures for third test

D119 with pull-up resistors D120

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	GA27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	FP65	yes
9	0000	no
10	0338	yes
11	1F39	yes
12	75AP	yes
13	A624	yes
14	A618	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	no

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	TA27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U219	yes
8	FP65	yes
9	0000	no
10	0338	yes
11	5F26	yes
12	9370	yes
13	AH74	yes
14	39FP	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	yes

D121

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	904F	yes
9	0000	no
10	0338	yes
11	791P	yes
12	76FU	yes
13	PP9C	yes
14	F6HA	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	no

D122

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	904F	yes
9	0000	no
10	0338	yes
11	F342	yes
12	P593	yes
13	1A46	yes
14	415H	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	yes

D123

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	94UH	yes
9	0000	no
10	0338	yes
11	3H71	yes
12	1H87	yes
13	7UAC	yes
14	089A	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	no

D124

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	94UH	yes
9	0000	no
10	0338	yes
11	6CF7	yes
12	28A0	yes
13	4A9H	yes
14	470F	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	yes

D125

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	FA28	yes
9	0000	no
10	0338	yes
11	U202	yes
12	2130	yes
13	7172	yes
14	532H	yes
15	7600	yes
16	H07A	yes
17	H30F	yes
18	59HP	no

D126

Pin	Signature	Probe tip blinking
1	FPA9	yes
2	6A27	yes
3	UP9A	yes
4	64U4	yes
5	3H18	yes
6	U01P	yes
7	U129	yes
8	FA28	yes
9	0000	no
10	0338	yes
11	9H31	yes
12	2PF0	yes
13	20C2	yes
14	6A51	yes
15	7600	yes
16	H97A	yes
17	H30F	yes
18	59HP	yes

Pin	Signature	Probe tip blinking
1	594P	yes
2	P791	yes
3	H490	yes
4	HHP8	yes
5	7459	yes
6	84U7	yes
7	A712	yes
8	85FC	yes
9	4F72	yes
10	0000	no
11	4F72	yes
12	85FC	yes
13	A712	yes
14	84U7	yes
15	7459	yes
16	HHP8	yes
17	H490	yes
18	P791	yes
19	0000	yes
20	59HP	no

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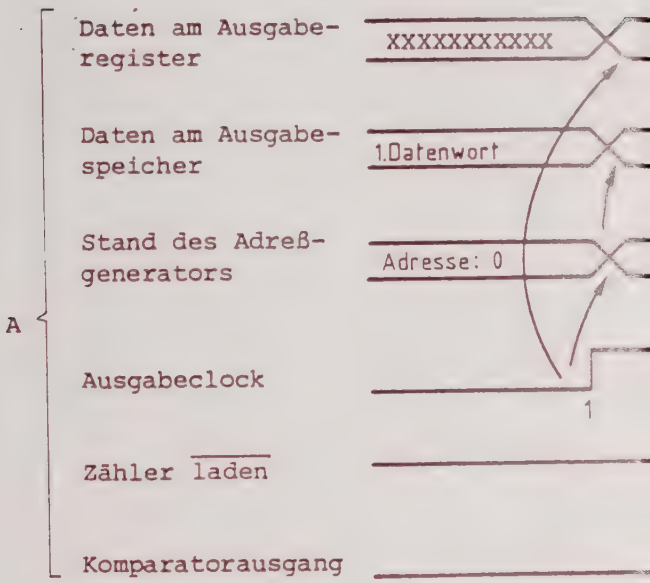
Bilder
Figures

R 29500 Bl. 1

A: Ausgabe repetierend
B: Ausgabe nicht repetierend



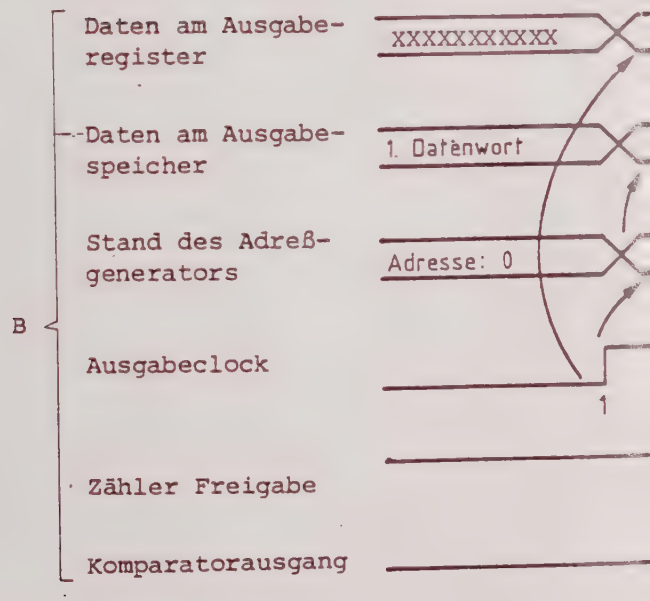
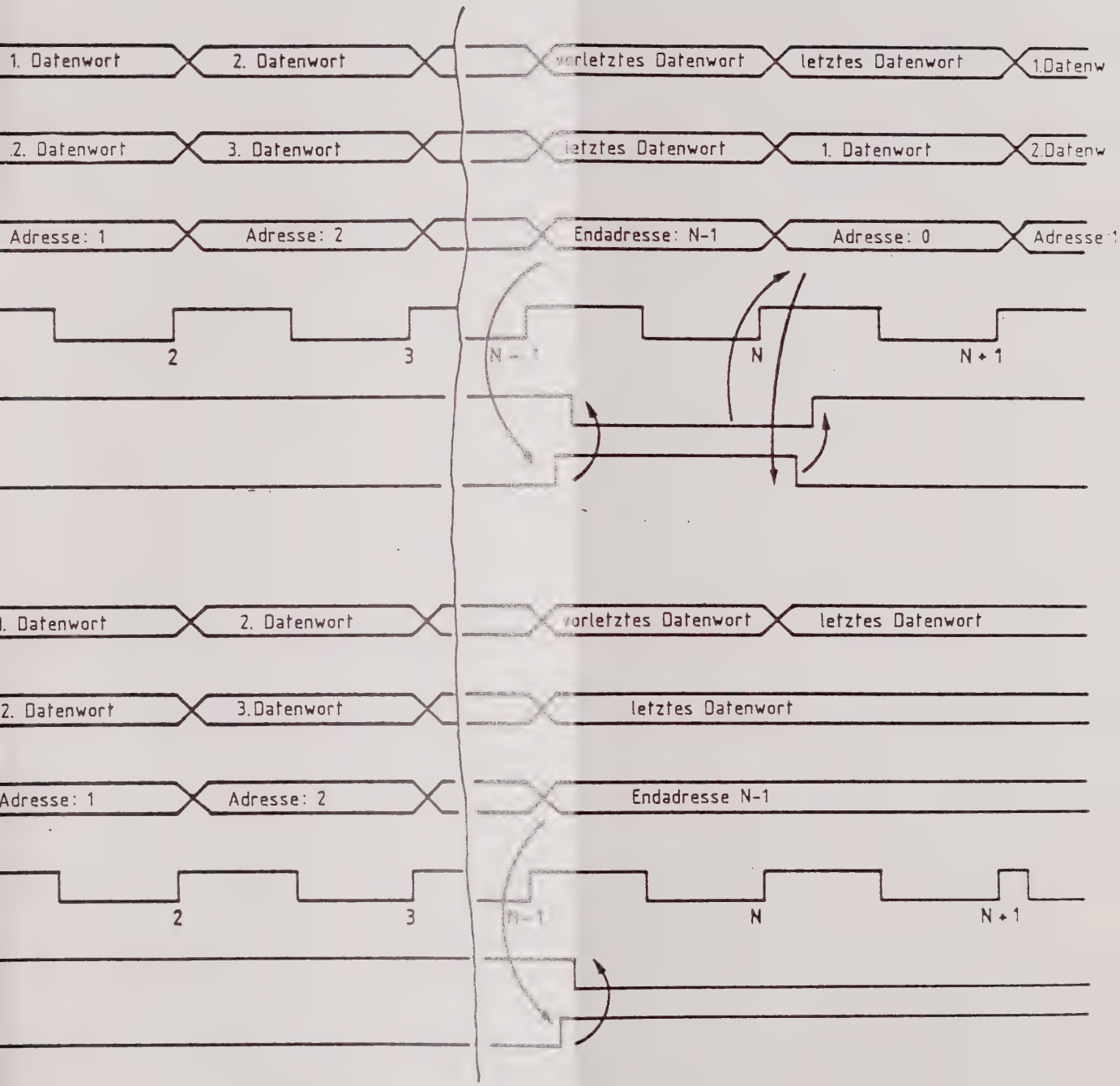


Bild 4-12 Ausgabe eines Moduls , de



aus N Zeilen besteht

344.2799-5.11

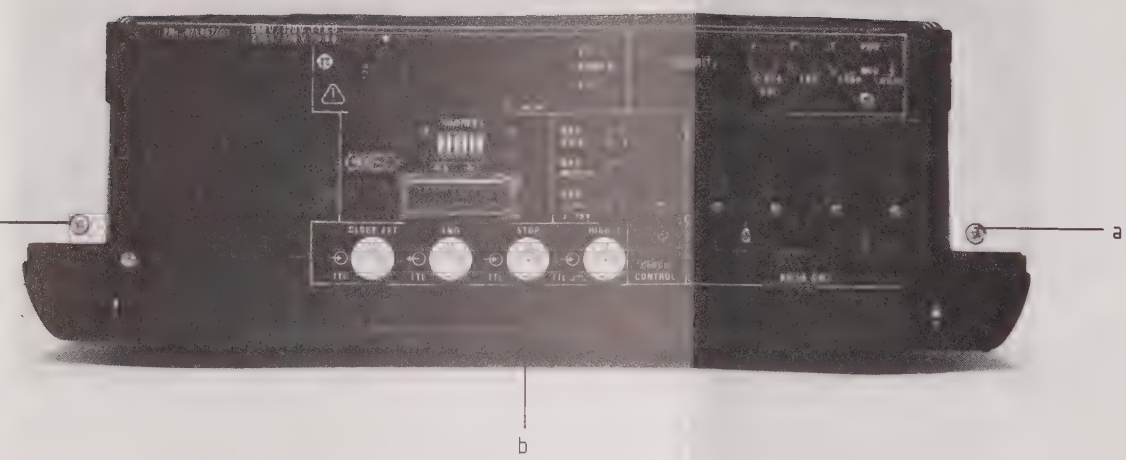


Bild 5-3 Lage der Schrauben zum Öffnen des Geräts

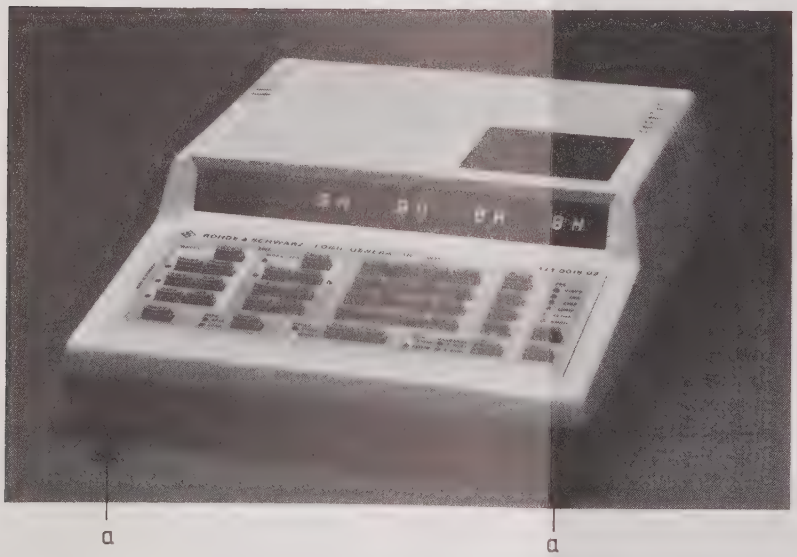
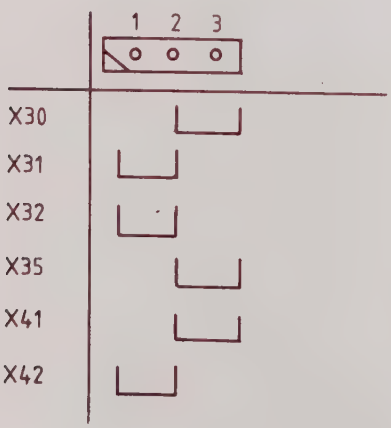


Bild 5-4 Lage der Schrauben zum Öffnen des Geräts

Jumper in Normalstellung:



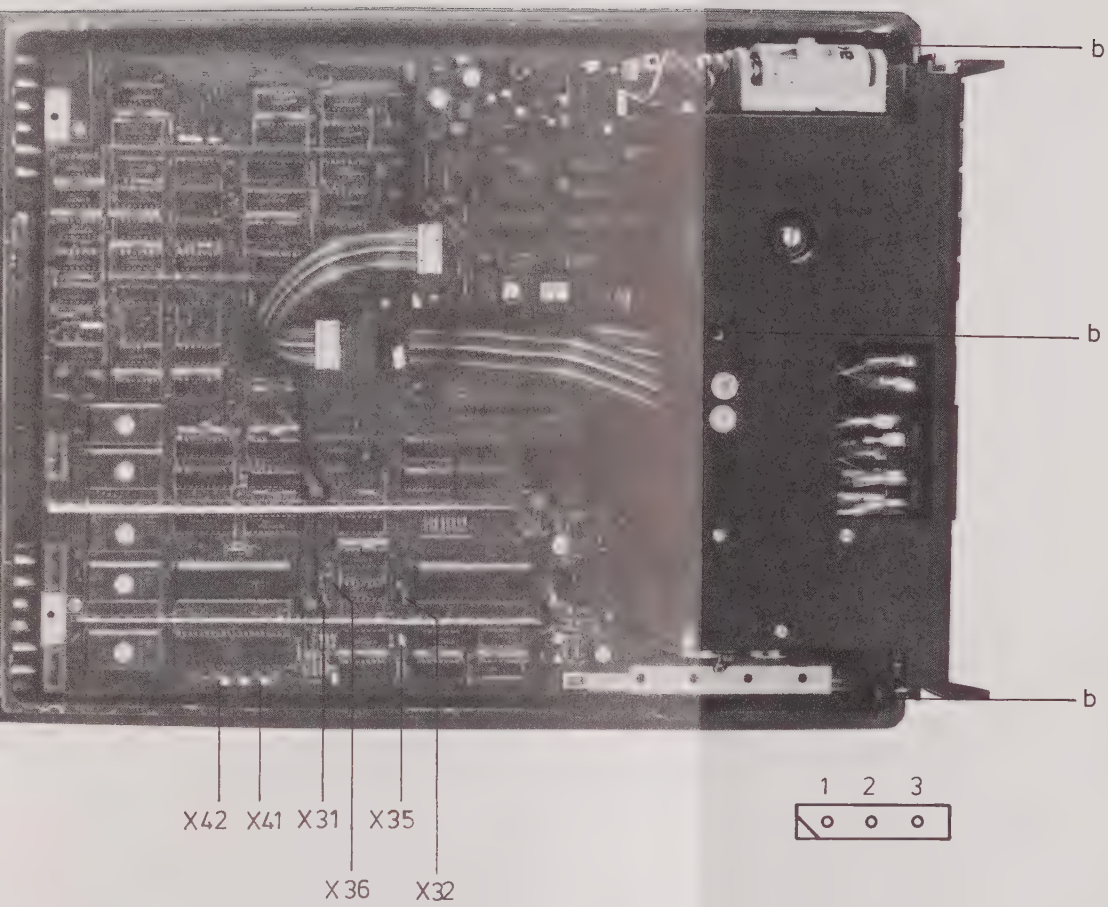


Bild 5-5 Innenansicht Unterseite
Fig. 5-5 Interior view botton

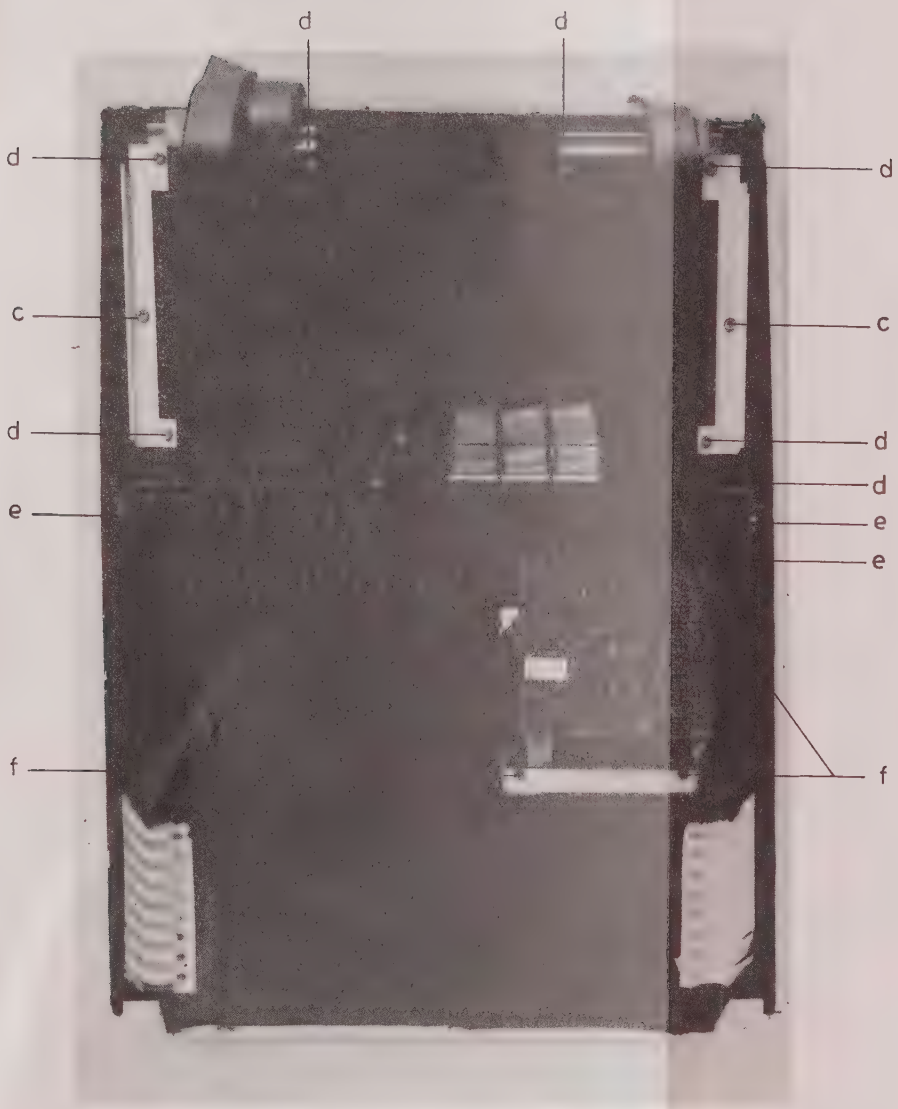


Bild 5-6 Innenansicht Oberseite
Fig 5-6 Interior view - cover

ROHDE & SCHWARZ
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Schaltteillisten
numerisch geordnet
Parts lists
in numerical order

R 29500 Bl. 3

ROHDE&SCHWARZ

AZ	Datum / Date	Schaltteilliste für / Parts list for	Sachnummer / Stock No	Blatt / Page
10	0134	IGA LOGIC-GENERATOR	344.0015.01 SA	1

Kennzeichen / Component No.	Benennung/Beschreibung / Designation	Sachnummer / Stock No.	enthalten in / contained in
A1	ED ANZEIGEEINHEIT INDICATION UNIT	344.0415	
A2	TASTENFELD KEYBOARD	344.0438	
A3	ED GRUNDPLATTE FUER VAR 02 ********** GRUNDPLATTE 344.2101.03 FUER VAR 03,04	344.2101.02	
A5	ED SYNTHESIZER SYNTHESIZER	344.0515	
A6	RUECKWAND FUER VAR 02 RUECKWAND 344.0209.03 FUER VAR 03,04	344.0209.02	
			- ENDE -

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AZ	Datum / Date	Schaltteilliste für / Parts list for	Sachnummer / Stock No.	Blatt / Page
04	0184	RUECKWAND	344.0209.01 SA	1

Kennzeichen / Component No.	Benennung/Beschreibung / Designation	Sachnummer / Stock No.	enthalten in / contained in
A4	ED ANSCHLUSSFELD FUER VAR 02 ********** ANSCHLUSSFELD 344.2130.03 FUER VAR 03	344.2130.02	
C200	CS 220NF250V10X26,5KL.X2 RADIO-SCREENING CAPACITOR ROEDERST F 1773-422-2000	006.0860	
E1	LUEFTEREINHEIT BLOWER UNIT	344.1334	
F1	SS SCHMELZS.TO,8BDIN41571 FUSE WICKMANN TO,8BDIN41571TROP. FUER 220V UND 240V SCHMELZSICHERUNG T1,6D SS 020.7500 FUER 100V UND 120V	SS 020.7417	
G1	EB 1,2V 1,5AH STAHLAKKU BATTERY DAIMON NC 200	EE 020.3805	
G2	EB 1,2V 1,5AH STAHLAKKU BATTERY DAIMON NC 200	EE 020.3805	
S1	SK WIPPSCH.2POL.AUS SW SWITCH MARQUARDT 1802.1102	SK 553.2925	
S2	ENTHALTEN IN X1		
T1	RINGKERNTRAFO TRANSFORMER	344.0838	
W1	KABEL	344.0673	
W2	KABEL	344.0680	
W3	KABEL	344.0696	
W4	KABEL	344.0709	
W5	KABEL	344.0715	
W6	KABEL	344.0721	
W7	KABEL	344.0738	
W211	KABEL W211	344.0573	
W212	KABEL W212	344.0580	
W213	KABEL W213	344.0596	
W214	KABEL W214	344.0609	
X1	FN EINBAUST.M.SPANNUNGSW. PANEL JACK K&B 42R34.3111-200 C4	FN 344.1463	
X100	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838
X120	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838

ROHDE&SCHWARZ	ÄZ	Datum Date	Schaltteilliste für Parts list for RUECKWAND	Sachnummer Stock No	Blatt Page
	04	0184		344.0209.01 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
X142	BUCHSENEINHEIT	344.0744	
X195	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838
X196	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838
X201	BUCHSENEINHEIT 3-POL.	344.0750	344.1334
X211	FJ EINBAUBUCHSE SYST.BNC FIXED BNC SOCKET,50 OHM SPINNER BN292700	FJ 017.6607	
BIS/TO X214			
X220	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838
X240	FV STECKHUELSE GROESSE4,8 VOGT 3773/0,5A VERZINNT	FV 066.0509	344.0838
Z1	LD NETZF.2A 55DB/10MHZ CHOKE CORCOM 2B1	LD 344.1428	
			- ENDE -

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	06	1281	ED ANZEIGEEINHEIT	344.0415 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C30	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C60	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C61	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C62	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C63	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C64	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C65	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C66	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C67	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C68	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0415
C70	CK 220NF+-5%63V5RM MKT WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.0415
C71	CK 220NF+-5%63V5RM MKT WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.0415
C80	CE 100UF-20+50%16V 8,5X20 ROEDERST ELKOEBS100/16	CE 022.7737	344.0415
C90 BIS	CC 47PF+-2%3X4N750	CC 087.6864	344.0415
C93	CC 47PF+-2%3X4N750	CC 087.6864	344.0415
C160	CC 100NF+-10%100V K1200VI AEROVOX CKR06BX104KL	CC 060.1149	344.0415
D30	PL SN74154N 1AUF16-DECOD. TEXAS SN74154N	PL 244.8509	344.0415
D31	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D32	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D33	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D34	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D35	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D36	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D37	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D38	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D39	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D40	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D41	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	06	1281	ED ANZEIGEEINHEIT	344.0415 SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
D42	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D43	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D44	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D45	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D46	BP 5082-7610 7SEGM.ANZ.RT HEWLETT-P. 5082-7610	BP 293.6241	344.0415
D50	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D51	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D52	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D53	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D54	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D55	BP TIL305 ALPHA-NUM.ANZ. TEXAS TIL305	BP 291.4264	344.0415
D60	BL SN74LS145N BCD/DEZ.DEC TEXAS SN74LS145N	BL 291.4335	344.0415
D61	BL SN74LS145N BCD/DEZ.DEC TEXAS SN74LS145N	BL 291.4335	344.0415
D62	BL SN74LS04N 6/INVERTER TEXAS SN74LS04ON	BL 266.2010	344.0415
D63	BL SN74LS293N 4BIT-ZAEHL. TEXAS SN74LS293N	BL 291.4341	344.0415
D64	BL SN74157N 4/MULTIPLEXER TEXAS SN74157N	BL 224.2440	344.0415
D65	BL SN7489N 64BIT-RAM TEXAS SN7489N	BL 244.8473	344.0415
D66	BL SN7489N 64BIT-RAM TEXAS SN7489N	BL 244.8473	344.0415
D67	BL SN7489N 64BIT-RAM TEXAS SN7489N	BL 244.8473	344.0415
D68	BL SN7489N 64BIT-RAM TEXAS SN7489N	BL 244.8473	344.0415
R30	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R31	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R32	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R33	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R34	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R35	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R36	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R37	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr
	06	1281	ED ANZEIGEEINHEIT	344.0415 SA	3

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R38	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R39	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R40	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R41	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R42	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R43	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R44	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R45	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.0415
R50	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R51	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R52	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R53	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R54	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R55	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R56	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R57	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R58	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R59	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R60	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R61	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R62	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R63	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R64	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R65	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0415
R70	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R71	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R72	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R73	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R74	RF 0,25W 22 OHM +-5%	RF 069.2202	344.0415

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	06	1281	ED ANZEIGEEINHEIT	344.0415 SA	4

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R75	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R76	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R77	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	344.0415
R80	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R81	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R82	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R83	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R84	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R85	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R86	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R87	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0415
R100	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R101	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R102	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R103	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R104	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R105	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R106	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R107	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R108	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R109	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R110	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R111	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R112	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R113	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R114	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R115	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R116	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	06	1281	ED ANZEIGEEINHEIT	344.0415 SA	5

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R117	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R118	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R119	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R120	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R121	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R122	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R123	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R124	RF 0,25W3,3KOHM +-5% DRALORIC LCA0207/+-5%3,3K	RF 069.3321	344.0415
R125	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R126	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R127	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R128	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R129	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.0415
R140	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R141	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R142	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R143	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R144	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R145	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R146	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R150	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R151	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R152	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R153	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R154	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R155	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R156	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	344.0415
R160	RF 0,25W330 OHM +-5% DRALORIC LCA0207/+-5%330	RF 069.3315	344.0415

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
V30	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V31	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V32	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V33	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V34	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V35	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V36	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V37	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V38	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V39	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V40	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V41	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V42	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V43	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V44	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V45	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V70	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V71	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V72	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V73	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V74	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V75	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V76	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V77	AK 2N2222A 40V0,8A300MHZ VALVO 2N2222A	AK 010.5405	344.0415
V100	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V101	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V102	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V103	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V104	AK 2N4033 PNP 80V 1A TO39	AK 083.6460	344.0415

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Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	VALVO 2N4033		
V105	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V106	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V107	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V108	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V109	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V110	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V111	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V112	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V113	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
V114	AK 2N4033 PNP 80V 1A TO39 VALVO 2N4033	AK 083.6460	344.0415
W33	VERBINDUNGSLEITUNG GR.	344.0767	344.0415
W34	VERBINDUNGSLEITUNG RT.	344.0773	344.0415
X30	FR JC-FASSUNG 16 POLIG EURO-DIP BU16 OZ IM MAGAZIN	FR 249.6091	344.0415
X31	FR JC-FASSUNG 16 POLIG EURO-DIP BU16 OZ IM MAGAZIN	FR 249.6091	344.0415
X32	FR JC-FASSUNG 16 POLIG EURO-DIP BU16 OZ IM MAGAZIN	FR 249.6091	344.0415

- ENDE -

ROHDE & SCHWARZ MÜNCHEN | ÄZ 07 | Datum 1180 | Schaltteilliste für TASTENFELD Z | Sachnummer 344.0438 SA | Blatt Nr. 1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C1	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C2	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C3	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C4	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C5	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C6	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C7	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C10	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
BIS			
C13	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.0438
C15	CE 100UF-20+50%16V 8,5X20 ROEDERST ELKOEBS100/16	CE 022.7737	344.0438
D1	BC P8279-5 KEYB/DISPL.I/O INTEL P 8279-5	BC 334.2496	344.0438
D2	BL SN74LS156N 2XDEMUX.1:4 TEXAS SN74LS156N	BL 341.8973	344.0438
D3	BL SN74LS273N 8BIT-D-REG. TEXAS SN74LS273N	BL 214.8998	344.0438
D4	BL SN74LS273N 8BIT-D-REG. TEXAS SN74LS273N	BL 214.8998	344.0438
D5	BL SN7417N HEX.BUFF.DRIV. TEXAS IC-SN7417N	BL 244.8538	344.0438
D6	BL SN7406N 6XINVERTER TEXAS IC-SN7406N	BL 237.0487	344.0438
D7	BL SN7406N 6XINVERTER TEXAS IC-SN7406N	BL 237.0487	344.0438
D10	BL SN7406N 6XINVERTER TEXAS IC-SN7406N	BL 237.0487	344.0438
D11	BL SN74LS139N 2XDEMUX.1:4 TEXAS SN74LS139N	BL 219.3265	344.0438
D12	BL SN74LS08N 4/2INP.AND TEXAS IC-SN74LS08N	BL 266.4664	344.0438
D13	BL SN74LS32N 4/2INP.OR TEXAS IC-SN74LS32N	BL 266.4687	344.0438
H1	AF 5082-4684 HI-EFF.LED HEWLETT LED5082-4684	AF 257.4736	344.0438
BIS			
H23	AF 5082-4684 HI-EFF.LED HEWLETT LED5082-4684	AF 257.4736	344.0438
R1	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R2	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R3	RF 0,25W180 OHM +-5%	RF 069.1812	344.0438

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ROHDE & SCHWARZ MÜNCHEN | ÄZ 07 | Datum 1180 | Schaltteilliste für TASTENFELD Z | Sachnummer 344.0438 SA | Blatt Nr. 2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC LCA0207/+-5%180		
R4	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R5	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R6	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R7	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R8	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R9	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R10	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R11	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R12	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R13	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R14	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R15	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R16	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R17	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R18	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R19	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R20	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R21	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0438
R22	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R23	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	344.0438
R24	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R25	RF 0,25W180 OHM +-5% DRALORIC LCA0207/+-5%180	RF 069.1812	344.0438
R26	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	344.0438
R30	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0438
BIS			
R34	RF 0,25W4,7KOHM +-5% DRALORIC LCA0207/+-5%4,7K	RF 069.4728	344.0438
S1	SR TASTER 1XA + 1XU O.KN. RAFI RS76M 3.13002.003	SR 518.0871	344.0438
S2	SR TASTER 1XA + 1XU O.KN. RAFI RS76M 3.13002.003	SR 518.0871	344.0438

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
S3	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S4	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S5	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S6	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S7	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S8	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S9	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S10	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S11	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S12	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S13	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S14	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S15	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S16	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S17	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S18	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S19	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S20	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S21	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S22	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S23	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S24	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S25	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S26	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S27	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S28	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S29	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S30	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S31	SB TASTER 1XA + 1XU 0.KN.	SB 518.0871	344.0438

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Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	RAFI RS76M 3.13002.003		
S32	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S33	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S34	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S35	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S36	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S37	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S38	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S39	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S40	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
S41	SB TASTER 1XA + 1XU 0.KN. RAFI RS76M 3.13002.003	SB 518.0871	344.0438
V1	AK 2N2369A SI NPN 40V0,2A VALVO TRANSIST2N2369A	AK 010.4680	344.0438
W20	BAND-KABEL Z	344.0615	344.0438
W21	BAND-KABEL Z	344.0621	344.0438
W23	BAND-KABEL Z	344.0638	344.0438
W30	BANDKABEL Z	344.0644	344.0438
W31	BANDKABEL Z	344.0650	344.0438
W32	BANDKABEL Z	344.0667	344.0438
			- ENDE -

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Kennzeichen / Component No.	Benennung/Beschreibung / Designation	Sachnummer / Stock No.	enthalten in / contained in
C50	CE 10000UF-10+50%40V35X50 ELECTROLYTIC CAPACITOR ROEDERST EYV00CD510G01	300.6401	
C51	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR SIEMENS B4136-B7226-Z	CE 022.7572	
C52	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR1-1/35	CE 022.8185	
C53	CC 3,3NF+-10%6X7R2000 CAPACITOR VALVO 2222 63051 332	CC 087.7083	
C54	CE 4,7UF+-20%20V 7X 4X 8 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR2-4,7/20	CE 022.8110	
C55	CC 2,7NF+-10%5X6R2000 CAPACITOR VALVO 2222 63051 272	CC 087.7077	
C57	CC 4,7NF+-10%6X9R2000 CAPACITOR VALVO 2222 63051 472	CC 087.7102	
C58	CE 10000KF-10+50%16V30X50 ELECTROLYTIC CAPACITOR ROEDERST EYV00BB510D	CE 219.3459	
C59	CK 6,8UF+-10% 63V QUADER CAPACITOR ROEDERSTEI MKT1822-568/06/10%	CK 065.7922	
C60	CE 1UF -10+100%63V 9X13 ELECTROLYTIC CAPACITOR ROEDERST ELKO EK 1/63	CE 022.7620	
C61	CK 150NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,15UF/5%	CK 099.2946	
C62	CK 470NF+-20%63V QUADER CAPACITOR ROEDERST MKC1862-447/06	CK 087.0943	
C65	CC 3,9NF+-10%6X8R2000 CAPACITOR VALVO 2222 63051 392	CC 087.7090	
C66	CE 4,7UF+-20%10V 5X 4X 7 ELECTPOLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR1,4,7/10	CE 022.8056	
C67	CE 2,2UF+-20%35V 7X 5X11 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR2,2,2/35	CE 022.8191	
C68	CC 4,7NF+-10%6X9R2000 CAPACITOR VALVO 2222 63051 472	CC 087.7102	
C80	DB STROMSCHIENE F.EK6 BUS BAR MEKTRON M823EK6	344.0821	
C81	DB STROMSCHIENE F.EK6 BUS BAR MEKTRON M823EK6	344.0821	
C82	DB STROMSCHIENE F.EK6 BUS BAR	344.0821	

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Kennzeichen / Component No.	Benennung/Beschreibung / Designation	Sachnummer / Stock No.	enthalten in / contained in
	MEKTRON M823EK6		
C83	DB STROMSCHIENE F.EK6 BUS BAR MEKTRON M823EK6	344.0821	
C90	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	
BIS/TO C94			
C95	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C101	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C102	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C103	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C104	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C150	CC 22PF+-2%3X4N750 VALVO 2222 678 58229 NICHT BESTUECKT/NOT IN PCB	CC 087.6829	
C151	CC 100PF+-2%4X5N750 CAPACITOR VALVO 2222 678 58101	CC 087.6906	
C152	CC 56PF+-2%5X6NP0 CAPACITOR VALVO 2222 678 10569	CC 087.6512	
C153	CC 100NF+-10%50V5K1200VIE CAPACITOR AEROVOX CKR05BX104KL	CC 084.5350	
C160	CC 10NF+80-20%50V Z5U AX. AVX MA105E103ZAAGEGURTET	344.1363	
C162	CC 10NF+80-20%50V Z5U AX. AVX MA105E103ZAAGEGURTET	344.1363	
BIS/TO C180			
C181	CC 56PF+-2%5X6NP0 CAPACITOR VALVO 2222 678 10569	CC 087.6512	
C182	CC 10NF+80-20%50V Z5U AX. AVX MA105E103ZAAGEGURTET	344.1363	
BIS/TO C186			
C401	CE 4,7UF+-20%10V 5X 4X 7 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR1,4,7/10	CE 022.8056	
C403	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELKOETR1-1/35	CE 022.8185	
C404	CC 100NF+-10%100V K1206VI CERAMIC CAPACITOR	CC 060.1149	

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Kennzeichen Component No	Benennung/Beschreibung Designation	Sachnummer Stock No	enthalten in contained in
	AEROVOX CKR06BX104KL		
D30	BL SN74LS244N 8XBUS-TREIB IC 8XBUS DRIVER TEXAS SN74LS244N	BL 092.8984	
D31	BL SN74LS273N 8BIT-D-REG. 8BIT-D-REGISTER TEXAS SN74LS273N	BL 214.8998	
D32	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N	BL 300.8833	
D33	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N	BL 300.8833	
D34	BL SN74LS138N DEMUX 1:8 DEMULTIPLEXER 1:8 TEXAS SN74LS138N	BL 510.1379	
D35	BL SN74154N 1AUF16-DECOD. IC DECODER SN74154N TEXAS SN74154N	BL 244.8509	
D37	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D40	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D41	BL SN74LS26N 4/2INP.NAND IC SN74LS26N 4/2INP.NAND TEXAS SN74LS26N	BL 280.7567	
D42	BL SN74LS32N 4/2INP.OR IC OR GATE SN74LS32N TEXAS SN74LS32N	BL 266.4687	
D44	BL SN74LS11N 3/3INP.AND IC AND GATE SN74LS11N TEXAS SN74LS11N	BL 266.4135	
D45	BL SN74LS08N 4/2INP.AND IC AND GATE SN74LS08N TEXAS SN74LS08N	BL 266.4664	
D50	BC P8085A 8BIT-CPU CPU INTEL P8085A	BC 335.8930	
D62	BC 27128 PROGR.1 D62	344.1770	
D63	BC 27128 PROGR.1 D63	344.1786	
D70	BC P8155 2K-RAM+I/O+TIMER RAM I/O AND TIMER INTEL P8155	BC 335.8952	
D90	BC TC5514P 1024X4BIT-RAM RAM TOSHIBA TC5514P	BC 344.1411	
D91	BC TC5514P 1024X4BIT-RAM RAM TOSHIBA TC5514P	BC 344.1411	
D100	:: BL SN74S85N / 1KSL/WK	344.2699	
D101	:: BL SN74S85N / 1KSL/WK	344.2699	
D102	:: BL SN74S85N / 1KSL/WK	344.2699	
D103	BL SN74LS161AN 4BIT-COUNT IC 4BIT-COUNTER	BL 344.1405	

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Kennzeichen Component No	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
D104	TEXAS SN74LS161AN BL SN74LS161AN 4BIT-COUNT IC 4BIT-COUNTER	BL 344.1405	
D105	TEXAS SN74LS161AN BL SN74LS161AN 4BIT-COUNT IC 4BIT-COUNTER	BL 344.1405	
D106	TEXAS SN74LS161AN BL SN74LS273N 8BIT-D-REG. 8BIT-D-REGISTER	BL 214.8998	
D107	TEXAS SN74LS273N BL SN74LS175N 4/D-FLIPFLO IC FLIP FLOP SN74LS175N	BL 291.5048	
D108	TEXAS SN74LS175N BL SN74LS244N 8XBUS-TREIB IC 8XBUS DRIVER	BL 092.8984	
D109	TEXAS SN74LS244N BL SN74LS125AN4/BUS-TREIB BL SN74LS125AN4/BUS-DRIV.	BL 292.0404	
D110	TEXAS SN74LS125AN BL SN74S157N 4XMUX 2 ZU 1 IC 4XMUX SN74S157N	BL 303.1346	
D111	TEXAS SN74S157N BL SN74S157N 4XMUX 2 ZU 1 IC 4XMUX SN74S157N	BL 303.1346	
D112	TEXAS SN74S157N BL SN74S157N 4XMUX 2 ZU 1 IC 4XMUX SN74S157N	BL 303.1346	
D113	TEXAS SN74S157N BL SN7400N -0+75 NAND6. IC NAND GATE SN7400N	BL 009.3219	
D114	TEXAS SN7400N BL SN74LS00N 4/2INP.NAND IC NAND GATE SN74LS00N	BL 266.4641	
D115	TEXAS SN74LS00N BL SN74LS26N 4/2INP.NAND IC SN74LS26N 4/2INP.NAND	BL 280.7567	
D116	TEXAS SN74LS26N BL SN74LS32N 4/2INP.OR IC OR GATE SN74LS32N	BL 266.4687	
D117	TEXAS SN74LS32N BL SN74LS32N 4/2INP.OR IC OR GATE SN74LS32N	BL 266.4687	
D118	TEXAS SN74LS32N BL SN74LS04N 6/INVERTER HEXINVERTER	BL 266.2010	
D119	TEXAS SN74LS04N BC HM6148LP-6 1KX4BIT-RAM 1KX4BIT CMOS RAM	344.7303	
BIS/TO D122 D123	HITACHI HM6148LP BC HM6148LP-6 1KX4BIT-RAM 1KX4BIT CMOS RAM	344.7303	
D124	HITACHI HM6148LP BC HM6148LP-6 1KX4BIT-RAM 1KX4BIT CMOS RAM	344.7303	
	HITACHI HM6148LP		

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
D125	BC HM6148LP-6 1KX4BIT-RAM 1KX4BIT CMOS RAM HITACHI HM6148LP	344.7303	
D126	BC HM6148LP-6 1KX4BIT-RAM 1KX4BIT CMOS RAM HITACHI HM6148LP	344.7303	
D127	BL 74F374PC 8BIT-D-REGIST 8BIT-D-REGISTER FAIRCHILD 74F374PC	344.6642	
D128	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N FUER VAR 03	BL 300.8833	
D129	BL 74F374PC 8BIT-D-REGIST 8BIT-D-REGISTER FAIRCHILD 74F374PC	344.6642	
D130	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N FUER VAR 03	BL 300.8833	
D131	BL 74F374PC 8BIT-D-REGIST 8BIT-D-REGISTER FAIRCHILD 74F374PC	344.6642	
D132	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N	BL 300.8833	
D133	BL 74F374PC 8BIT-D-REGIST 8BIT-D-REGISTER FAIRCHILD 74F374PC	344.6642	
D134	BL SN74LS245N 8XBUS-TRSCV IC 8XBUS TRSCV SN74LS245N TEXAS SN74LS245N	BL 300.8833	
D135	BL SN7432N POS OR GATE IC OR GATE SN7432N TEXAS SN7432N	BL 204.9933	
D150	BL SN74LS08N 4/2INP.AND IC AND GATE SN74LS08N TEXAS SN74LS08N	BL 266.4664	
D151	BL SN74123N DUAL MONOFLOP IC MONOSTABLE MULTIVIBRAT TEXAS SN74123N	BL 104.4660	
D152	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D153	BL SN74LS00N 4/2INP.NAND IC NAND GATE SN74LS00N TEXAS SN74LS00N	BL 266.4641	
D154	BL SN74LS02N 4/2INP.NOR IC NOR GATE SN74LS02N TEXAS SN74LS02N	BL 266.4658	
D155	BL 74F00PC 4/2INPUT-NAND QUAD-NAND-GATE FAIRCHILD 74F00PC	344.6659	
D156	BL SN74LS08N 4/2INP.AND IC AND GATE SN74LS08N TEXAS SN74LS08N	BL 266.4664	
D157	BL SN74S32N 4/2INP.OR-GAT	BL 344.1357	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	IC 4/2INP.OR.GATE TEXAS SN74S32N		
D158	BL SN74S151N 8:1-MULTIPL. IC 8:1MULTIPL.SN74S151N TEXAS SN74S151N	BL 303.1446	
D159	BL SN74S08N 4/2INP.AND-G. IC AND GATE SN74S08N TEXAS SN74S08N	BL 303.1330	
D160	BL 74F00PC 4/2INPUT-NAND QUAD-NAND-GATE FAIRCHILD 74F00PC	344.6659	
D161	BL 74F32PC 4X2INP OR GATE QUAD 2-INP. OP. GATE FAIRCHILD 74F32PC	344.7155	
D162	BL SN74S74N 2/D-FLIPFLOP IC FLIP-FLOP SN74S74N TEXAS SN74S74N	BL 266.6621	
D163	BL SN74S74N 2/D-FLIPFLOP IC FLIP-FLOP SN74S74N TEXAS SN74S74N	BL 266.6621	
D164	BL SN74S74N 2/D-FLIPFLOP IC FLIP-FLOP SN74S74N TEXAS SN74S74N	BL 266.6621	
D165	BL SN74S74N 2/D-FLIPFLOP IC FLIP-FLOP SN74S74N TEXAS SN74S74N	BL 266.6621	
D166	BL SN74LS08N 4/2INP.AND IC AND GATE SN74LS08N TEXAS SN74LS08N	BL 266.4664	
D167	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D168	BL SN74S157N 4XMUX 2 ZU 1 IC 4XMUX SN74S157N TEXAS SN74S157N	BL 303.1346	
D169	BL SN74S157N 4XMUX 2 ZU 1 IC 4XMUX SN74S157N TEXAS SN74S157N	BL 303.1346	
D170	BL 74F74PC 2/D-FLIPFLOP DUAL D-FLIPFLOP FAIRCHILD 74F74PC	344.6694	
D171	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D172	BL 74F32PC 4X2INP OR GATE QUAD 2-INP. OP. GATE FAIRCHILD 74F32PC	344.7155	
D173	BL 74F08PC 4X2INP AND G. 4X2-INPUT AND GATE FAIRCHILD 74F08PC	344.6920	
D174	BL SN74LS04N 6/INVERTER HEXINVERTER TEXAS SN74LS04N	BL 266.2010	
D175	BL SN74LS273N 8BIT-D-REG. 8BIT-D-REGISTER TEXAS SN74LS273N	BL 214.8998	
D176	BL SN74LS273N 8BIT-D-REG.	BL 214.8998	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	8BIT-D-REGISTER		
	TEXAS SN74LS273N		
D177	BL SN74LS273N 8BIT-D-REG.	BL 214.8998	
	8BIT-D-REGISTER		
	TEXAS SN74LS273N		
D178	BL SN74LS138N DEMUX 1:8	BL 510.1379	
	DEMULTIPLEXER 1:8		
	TEXAS SN74LS138N		
D179	BL SN74LS139N 2XDEMUX.1:4	BL 219.3265	
	IC 2XDEMUX.1:4 SN74LS139N		
	TEXAS SN74LS139N		
D400	BO AD581J 10V-REF.SPG.QU.	BO 300.6347	
	IC CONSTANT TO STABILIZE		
	ANALOG-DEV AD581J		
D401	BO TCA965 FENSTER-DISKRIM	BO 279.2213	
	IC DISCRIMINATOR TCA965		
	SIEMENS TCA965		
D402	BL SN74LS38N 4/2INP.NANDO	BL 216.2000	
	LOW POWER		
	TEXAS SN74LS38N		
L1	SPEICHERDROSSEL 160UH/10A	344.0815	
	CHOKE 160UH/10A		
N10	BO MC3302P 4/KOMPARATOR	BO 233.9744	
	IC COMPARATOR MC3302P		
	MOTOROLA MC3302P		
N11	BO UA723C -0+70 SPGSREGL	BO 009.0190	
	IC VOLTAGE STABILIZER		
	NSC LM723CN		
N12	BO TDA1060B SCHALTREGLER	510.6758	
	IC SWITCHING CONTROL		
	VALVO TDA1060B		
N13	BO UA7812KC SPGS.REGL.12V	BO 267.6777	344.0173
	IC VOLTAGE STABILIZER		
	MOTOROLA MC7812CK		
R40	RL 0,35W 1KOHM+-1%TK50	RL 082.2160	
	RESISTOR		
	DRALORIC SMA0207/1K-F-C		
R50	RD 3 W 0,05 OHM+-3%	RD 069.1964	
	RESISTOR		
	SAGE 1200S/080200HM/3%		
R51	RL 0,35W 499 OHM+-1%TK50	RL 083.0410	
	RESISTOR		
	DRALORIC SMA0207/499OHM-F-D		
R52	RL 0,35W 365 OHM+-1%TK50	RL 083.0290	
	RESISTOR		
	DRALORIC SMA0207/365OHM-F-D		
R53	RF 0,5 W 1 KOHM +-5%	RF 007.1377	
	DEPOS.-CARBON RESISTOR		
	RESISTA SK4/1K5%		
R54	RL 0,35W 8,25KOHM+-1%TK50	RL 083.1239	
	RESISTOR		
	DRALORIC SMA0207/8,25K-F-D		
R55	RL 0,35W 10,0KOHM+-1%TK50	RL 083.1297	
	RESISTOR		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DRALORIC SMA0207/10K-F-D		
R56	RL 0,35W 22,1KOHM+-1%TK50	RL 083.1545	
	RESISTOR		
	DRALORIC SMA/207/22,1K-F-C		
R57	RF 0,5 W 1 KOHM +-5%	RF 007.1377	
	DEPOS.-CARBON RESISTOR		
	RESISTA SK4/1K5%		
R58	RF 0,5 W 1 KOHM +-5%	RF 007.1377	
	DEPOS.-CARBON RESISTOR		
	RESISTA SK4/1K5%		
R59	RL 0,35W 332 OHM+-1%TK50	RL 083.0255	
	RESISTOR		
	DRALORIC SMA0207/332OHM-F-D		
R60	RL 0,35W 100KOHM+-1%TK50	RL 082.1764	
	RESISTOR		
	DRALORIC SMA0207/100K-F-C		
R61	RF 0,5 W 470 OHM +-5%	RF 007.1331	
	DEPOS.-CARBON RESISTOR		
	RESISTA SK4/470OHM5%		
R62	RL 0,35W 100 OHM+-1%TK50	RL 082.6543	
	DEPOS.-CARBON RESISTOR		
	DRALORIC SMA0207/100/HM-F-D		
R63	RL 0,35W 10,0 OHM+-1%TK50	RL 082.8852	
	RESISTOR		
	DRALORIC SMA0207/100OHM-F-D		
R64	RF 1,0W 1,2 OHM +-5%	RF 007.2221	
	RESISTOR		
	DRALORIC LCA 0922 1,20HM+-5%		
R66	RL 0,35W 34,8 OHM+-1%TK50	RL 082.9371	
	RESISTOR		
	DRALORIC SMA0207/34,8OHM-F-D		
R67	RL 0,35W 54,9 OHM+-1%TK50	RL 082.9565	
	RESISTOR		
	DRALORIC SMA0207/54,9OHM-F-D		
R68	RL 0,35W 4,75KOHM+-1%TK50	RL 083.1097	
	RESISTOR		
	DRALORIC SMA0207/4,75K-F-D		
R69	RS 0,75W5000HM+-10%CERMET	RS 037.7350	
	DEPOS.-CARBON POTENTIOMET		
	BOURNS 3006P-1-500 OHM+-10%		
R70	RL 0,35W 5,62KOHM+-1%TK50	RL 082.2190	
	RESISTOR		
	DRALORIC SMA0207/5,62K-F-C		
R71	RL 0,35W 1KOHM+-1%TK50	RL 082.2160	
	RESISTOR		
	DRALORIC SMA0207/1K-F-C		
R72	RL 0,35W 15,0KOHM+-1%TK50	RL 083.1400	
	RESISTOR		
	DRALORIC SMA0207/15K-F-D		
R73	RL 0,35W 10,0KOHM+-1%TK50	RL 083.1297	
	RESISTOR		
	DRALORIC SMA0207/10K-F-D		
R74	RL 0,35W2,21MOHM+-1%TK50	RL 099.8173	
	METALFILMRESISTOR		
	RESISTA MK2 2,21MOHM 1% TK50		
R75	RL 0,35W 274 OHM+-1%TK50	RL 083.0178	
	RESISTOR		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	RESISTOR		
	DRALORIC SMA0207/2,37K-F-D		
R402	RL 0,35W 9,53KOHM+-1%TK50	RL 082.1735	
	RESISTOR		
	DRALORIC SMA0207/9,53K-F-C		
R403	RL 0,35W 182 OHM+-1%TK50	RL 083.0010	
	RESISTOR		
	DRALORIC SMA0207/1820HM-F-D		
R404	RL 0,35W 243 OHM+-1%TK50	RL 083.0126	
	DEPOS.-CARBON RESISTOR		
	DRALORIC SMA0207/2430HM-F-D		
R405	RL 0,35W 4,75KOHM+-1%TK50	RL 083.1097	
	RESISTOR		
	DRALORIC SMA0207/4,75K-F-D		
R406	RL 0,35W 4,32KOHM+-1%TK50	RL 082.6572	
	RESISTOR		
	DRALORIC SMA0207/4,32K-F-D		
R407	RL 0,35W 475 OHM+-1%TK50	RL 083.0390	
	RESISTOR		
	DRALORIC SMA0207/4750HM-F-D		
R408	RL 0,35W 392 OHM+-1%TK50	RL 082.2183	
	RESISTOR		
	DRALORIC SMA0207/392K-F-C		
R409	RL 0,35W 10,0KOHM+-1%TK50	RL 083.1297	
	RESISTOR		
	DRALORIC SMA0207/10K-F-D		
R410	RL 0,35W 2,21KOHM+-1%TK50	RL 082.2477	
	RESISTOR		
	DRALORIC SMA 0207/2,21K-F-C		
V20	AG B40C5000/3300 BRGL	AG 084.5115	
	RECTIFIER		
	SIEMENS B40C5000/3300		
V21	AK 2N2222A NPN 40V 800MA	AK 010.5405	
	TRANSISTOR		
	VALVO 2N2222A		
V22	AL 2N4919 PNP 60V 1A0	AL 010.0361	344.0173
	TRANSISTOR		
	VALVO BD236		
V23	AL 2N4399 PNP 60V 30A0	AL 010.0349	344.0173
	TRANSISTOR		
	MOTOROLA 2N4399		
V25	AL 2N5296 NPN 40V 4A0	AL 010.1116	344.0173
	TRANSISTOR		
	RCA 2N5296		
V26	AG MBR2540 GL 40V25A0	AG 086.9930	344.0173
	RECTIFIER		
	MOTOROLA MBR2540 M.ZUBEHOER		
V27	AE JCT5 5V SUPPR	AE 012.5502	
	SUPPRESSOR DIODE		
	SEMICON 1N5907		
V101	AD 1N4151 50V 0,2 A UDI	AD 012.0723	
	DIODE		
	AEG-TELEF 1N4151		
V102	AD 1N4151 50V 0,2 A UDI	AD 012.0723	
	DIODE		
	AEG-TELEF 1N4151		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V105	AK BCY79IX PNP 45V 200MA	AK 010.3777	
	TRANSISTOR		
	SIEMENS BCY79IX		
V106	AK BSS44 PNP 60V500MA	AK 086.8286	
	TRANSISTOR		
	AEG-TELEF. BSS44		
V108	AK BSX26 NPN 40V 500MA	AK 010.4667	
	TRANSISTOR		
	SGS BSX26		
V109	AD 1N4151 50V 0,2 A UDI	AD 012.0723	
	DIODE		
	AEG-TELEF 1N4151		
V110	AD 1N4151 50V 0,2 A UDI	AD 012.0723	
	DIODE		
	AEG-TELEF 1N4151		
V170	AD 1N4531 75V 0,15A UDI	AD 082.6514	
	DIODE		
	UNITRODE 1N4531		
V171	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V172	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V173	AE BZX79/C5V1 0,5W Z-DI	AE 012.2449	
	ZENER DIODE		
	VALVO BZX79/C5V1		
V174	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V175	AD 1N4531 75V 0,15A UDI	AD 082.6514	
	DIODE		
	UNITRODE 1N4531		
V176	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V400	AK 2N2907A PNP 60V 600MA	AK 010.3583	
	TRANSISTOR		
	VALVO 2N2907A		
W38	KABEL	344.0896	
W40	VERBINDUNGSLEITUNG RT.	344.0538	
W41	VERBINDUNGSLEITUNG GR.	344.0544	
W42	VERBINDUNGSLEITUNG RT.	344.0550	
W43	VERBINDUNGSLEITUNG GR.	344.0567	
W44	VERBINDUNGSLEITUNG RT.	344.0850	
W45	VERBINGUNGSLEITUNG GR.	344.0867	
W46	VERBINDUNGSLEITUNG RT.	344.0873	
W47	VERBINDUNGSLEITUNG GR.	344.0880	
X100B	FP IND.BUCHSENLEISTE 64P.	FP 278.1913	
	FEMALE MULTIPOINT CONNECT		
	ERNI 9722.343.481.2		
X13B	FR IC-FASSUNG 16 POLIG	FR 249.6091	
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X14B	FR IC-FASSUNG 16 POLIG	FR 249.6091	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No	enthalten in contained in
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X150B	FR JC-FASSUNG 16 POLIG	FR 249.6091	
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X160S	FV STECKSTIFT GR.2,8	FV 495.9462	
	PIN		
	112619700 3775A/0,5MS-S18		
BIS/TO			
X162S			
X172S	FV STECKSTIFT GR.2,8	FV 495.9462	
	PIN		
	112619700 3775A/0,5MS-S18		
X20B	FR JC-FASSUNG 16 POLIG	FR 249.6091	
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X200S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X21B	FR JC-FASSUNG 16 POLIG	FR 249.6091	
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X23B	FR JC-FASSUNG 16 POLIG	FR 249.6091	
	16-PIN IC-SOCKET		
	PRECICONT US016T		
X30B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X30S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X31B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X31S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X310.1	FP INDIREKT.STECKERL.36P.	FP 242.3600	
	MALE MULTIPOINT CONNECTOR		
	BERG 75160-102-36		
	2-POLIG		
X310.2	FP INDIREKT.STECKERL.36P.	FP 242.3600	
	MALE MULTIPOINT CONNECTOR		
	BERG 75160-102-36		
	12-POLIG		
X32B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X32S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X33S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X34S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X35B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X35S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X36S	VL WIRE-WRAP PIN	VL 088.4507	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	BERG NR. 75 403-001		
X41B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X41S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X42B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X42S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X60S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
	NICHT BESTUECKT/NOT IN PCB		
X61B	FP KURZSCHLUSSBUCHSE	FP 491.7042	
	SHORTING PLUG		
	BERG 65474-004		
X61S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X62B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X62S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X63B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X63S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X64B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X64S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X65S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X66S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X90B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X90S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X92B	FP KURZSCHL.BUCHSE OFFEN	FP 342.1895	
	SHORTING LINK		
	BERG 76264-101		
X92S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X93S	VL WIRE-WRAP PIN	VL 088.4507	
	BERG NR. 75 403-001		
X95S	FV FLACHSTECKER GR4,8X0,8	FV 545.4000	
	PLUG		
	VOGT&CO 3826 MS/0,8 VERZINNT		
X96S	FV FLACHSTECKER GR4,8X0,8	FV 545.4000	
	PLUG		
	VOGT&CO 3826 MS/0,8 VERZINNT		

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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
06	0883	ED ANSCHLUSSFELD TERMINAL BOARD	344.0473.01 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C2	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C3	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C4	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C5	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C7	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C8	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C9	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C11	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	AEROVOX CKR05BX104KL		
C12	CC 3,9PF+-0,25PF3X4NPO CAPACITOR	CC 087.6370	
	VALVO 2222 678 09398		
D201	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER	BL 344.1386	
	TEXAS SN74S240N		
D202	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER	BL 344.1386	
	TEXAS SN74S240N		
D203	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER	BL 344.1386	
	TEXAS SN74S240N		
D204	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER	BL 344.1386	
	TEXAS SN74S240N		
D205	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER	BL 344.1386	
	TEXAS SN74S240N		
D206	BL SN74S04N HEX-INVERTER IC INVERTER SN74S04N	BL 289.4483	
	TEXAS SN74S04N		
D207	BL SN74S32N 4/2INP.OR-GAT IC 4/2INP.OR.GATE	BL 344.1357	
	TEXAS SN74S32N		
D208	BL SN74S132N 4XSCHMITT-TR IC SCHMITT-TRIGGER	BL 283.9002	
	TEXAS SN74S132N		

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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
06	0883	ED ANSCHLUSSFELD TERMINAL BOARD	344.0473.01 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
H1	EF T1 SV 115MA M.STIFTEN LAMP	344.0796	
	MGG MGG 1150-8		
R1	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR	RL 083.1545	
	DRALORIC SMA/207/22,1k-F-C		
R2	RL 0,25W 47,5KOHM+-1%TK50 RESISTOR	RL 083.1800	
	DRALORIC SMA/207/47,5K-F-C		
R3	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR	RL 083.1297	
	DRALORIC SMA0207/10K-F-D		
R5	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R6	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R7	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR	RL 083.1297	
	DRALORIC SMA0207/10K-F-D		
R9	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R10	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R11	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R12	RL 0,35W 332 OHM+-1%TK50 RESISTOR	RL 083.0255	
	DRALORIC SMA0207/3320HM-F-D		
R13	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR	RL 082.2477	
	DRALORIC SMA 0207/2,21K-F-C		
R14	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR	RL 082.2477	
	DRALORIC SMA 0207/2,21K-F-C		
R15	RL 0,35W 1KOHM+-1%TK50 RESISTOR	RL 082.2160	
	DRALORIC SMA0207/1K-F-C		
R200	RS 0,5W 100KOHM+-10% LIN. RESISTOR	344.1492	
	MENTOR R&S-ZCHNG.344.1492		
R201	RS 0,5W 2KOHM+-10% LINEAR RESISTOR	344.1505	
	MENTOR R&S-ZCHNG.344.1505		
R202	RS 0,5W 100KOHM+-10% LIN. RESISTOR	344.1492	
	MENTOR R&S-ZCHNG.344.1492		
S20	SK SCHIEBESCH.2X2 CS SWITCH	344.1328	
	SWITCHCRAFT C56206 L2		
S21	SK SCHIEBESCH.2X2 CS	344.1328	

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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
06	0883	EF ANSCHLUSSFELD TERMINAL BOARD	344.0473.01 SA	3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	SWITCH		
	SWITCHCRAF C56206 L2		
S22	SK SCHIEBESCH.2X2 GS	344.1328	
	SWITCH		
	SWITCHCRAF C56206 L2		
S23	SK SCHIEBESCH.2X2 GS	344.1328	
	SWITCH		
	SWITCHCRAF C56206 L2		
V1	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V2	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V5	AD BAV10 60V 0,3 A UDI	AD 012.9437	
	DIODE		
	VALVO BAV10		
V6	AD BAV10 60V 0,3 A UDI	AD 012.9437	
	DIODE		
	VALVO BAV10		
X200	FP STECKERL.INDIR.64POL16	FP 084.6470	
	64-PIN INSERT		
	ERNI STV-P-264 9722.331.		
X201	FM STECKERLEISTE 25P.	344.1311	
	25-PIN CONNECTOR		
	CANNON MDB1-25P-L1		
	FUER VAR 03		
X202	FM STECKERLEISTE 25P.	344.1311	
	25-PIN CONNECTOR		
	CANNON MDB1-25P-L1		
	FUER VAR 03		
X203	FM STECKERLEISTE 25P.	344.1311	
	25-PIN CONNECTOR		
	CANNON MDB1-25P-L1		
X204	FM STECKERLEISTE 25P.	344.1311	
	25-PIN CONNECTOR		
	CANNON MDB1-25P-L1		
X205	FM STECKERLEISTE 25P.	344.1311	
	25-PIN CONNECTOR		
	CANNON MDB1-25P-L1		
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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
11	0184	ED SYNTHESIZER SYNTHESIZER	344.0515 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
B1	EQ 6,000 MHZ CL30PF HC43U	EQ 302.7186	
	CRYSTAL 6,000MHZ		
C2	CK 100NF+-5%63V5RM MKT	CK 099.2930	
	CAPACITOR		
	WIMA MKS/2/63/0,1UF/5%		
C3	CC 10NF-20+50%7X8R6000	CC 087.7525	
	CAPACITOR		
	VALVO 2222 63051 64051103		
C4	CK 68NF+-5%63V5RM MKT	CK 099.2923	
	CAPACITOR		
	WIMA MKS2/63/0,068UF/5%		
C5	CK 1UF+-10%50V5RM MKT	CK 099.2998	
	CAPACITOR		
	WIMA MKS2/50/1UF/10%		
C6	CC 1NF+-10%63V K2000	CC 022.0784	
	CERAMIC CAPACITOR		
	VALVO 2222 63051 102		
C7	CK 1UF+-10%50V5RM MKT	CK 099.2998	
	CAPACITOR		
	WIMA MKS2/50/1UF/10%		
C8	CE 100UF-10+100%16V 11X13	CE 022.7550	
	ELECTROLYTIC CAPACITOR		
	SIEMENS B41316-A4107-Z		
C20	CC 10NF-20+50%7X8R6000	CC 087.7525	
	CAPACITOR		
	VALVO 2222 63051 64051103		
C22	CC 100PF+-2%4X5N750	CC 087.6906	
	CAPACITOR		
	VALVO 2222 678 58101		
C23	CK 100NF+-5%63V5RM MKT	CK 099.2930	
	CAPACITOR		
	WIMA MKS/2/63/0,1UF/5%		
C25	CC 10NF-20+50%7X8R6000	CC 087.7525	
	CAPACITOR		
	VALVO 2222 63051 64051103		
C26	CC 10NF-20+50%7X8R6000	CC 087.7525	
	CAPACITOR		
	VALVO 2222 63051 64051103		
C27	CE 100UF-10+100%16V 11X13	CE 022.7550	
	ELECTROLYTIC CAPACITOR		
	SIEMENS B41316-A4107-Z		
C28	CC 100PF+-2%4X5N750	CC 087.6906	
	CAPACITOR		
	VALVO 2222 678 58101		
C29	CK 220NF+-5%63V5RM MKT	CK 099.2952	
	CAPACITOR		
	WIMA MKS2/63/0,22UF/5%		
C30	CC 22PF+-2%3X4N750	CC 087.6829	
	VALVO 2222 678 58229		
C31	CC 47PF+-2%5X6NP0	CC 087.6506	
	CAPACITOR		
	VALVO 2222 678 10479		
C32	CC 10NF-20+50%7X8R6000	CC 087.7525	
	CAPACITOR		
	VALVO 2222 63051 64051103		

Kennzeichen/Component No.	Benennung/Beschreibung/Designation	Sachnummer/Stock No.	enthalten in/contained in
C33	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C34	CE 47UF+-50-10%40V 9X13 ELECTROLYTIK CAPACITOR ROEDERST EK 00 CB 247 G	006.7142	
C35	CE 47UF+-50-10%40V 9X13 ELECTROLYTIK CAPACITOR ROEDERST EK 00 CB 247 G	006.7142	
D1	BL SN7402N -0+75 NOR-G IC NOR GATE SN7402N TEXAS SN7402N	BL 009.3231	
D2	BL SN7492AN TEILER D.12 IC DIVIDER SN7492N TEXAS IC-SN749AN	BL 080.4266	
D3	BL SN74LS390N 2XDEC.COUNT IC DECADE COUNTER SN74LS3 TEXAS SN74LS390N	BL 300.6760	
D4	BL MC4044P PHASE-L-L PHASE LOCKED LOOP MOTOROLA MC4044P	BL 443.2980	
D5	BL SN74LS293N 4BIT-ZAEHL. IC BIT-COUNTER SN74LS293N TEXAS SN74LS293N	BL 291.4341	
D6	BL SN74LS390N 2XDEC.COUNT IC DECADE COUNTER SN74LS3 TEXAS SN74LS390N	BL 300.6760	
D7	BL SN74LS390N 2XDEC.COUNT IC DECADE COUNTER SN74LS3 TEXAS SN74LS390N	BL 300.6760	
D8	BL SN74LS390N 2XDEC.COUNT IC DECADE COUNTER SN74LS3 TEXAS SN74LS390N	BL 300.6760	
D9	BL SN74S151N 8:1-MULTIPL. IC 8:1MULTIPL.SN74S151N TEXAS SN74S151N	BL 303.1446	
D10	BL SN74LS373N 8BIT-D-REG. BL SN74LS373N 8BIT-D-REG. TEXAS SN74LS373N	BL 336.7543	
D11	BL SN74LS151N MULTIPLEXER IC MULTIPLEXER SN74LS151N TEXAS SN74LS151N	BL 266.7963	
N1	BO CA3130S CMOS-OP.AMP. IC OP.AMP.CA3130S RCA CA3130S	BO 303.9282	
N2	BO CA3130S CMOS-OP.AMP. IC OP.AMP.CA3130S RCA CA3130S	BO 303.9282	
R9	RL 0,25W 392 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/392K-F-C	RL 083.2512	
R10	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	

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Kennzeichen/Component No.	Benennung/Beschreibung/Designation	Sachnummer/Stock No.	enthalten in/contained in
R11	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R12	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R13	RF 0,25W 3,3 OHM +-5% RESISTOR DRALORIC LCA0207/+-5%3,3	RF 073.9995	
R14	RF 0,25W 4,7 OHM +-5% RESISTOR DRALORIC LCA0207/+-5%4,7	RF 074.0033	
R15	RF 0,25W 4,7 OHM +-5% RESISTOR DRALORIC LCA0207/+-5%4,7	RF 074.0033	
R16	RF 0,25W 3,3 OHM +-5% RESISTOR DRALORIC LCA0207/+-5%3,3	RF 073.9995	
R17	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R18	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R19	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/475K-F-C	RL 083.1039	
R20	RL 0,35W 475 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/475K-F-C	RL 083.2593	
R21	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R22	RL 0,25W 1,24KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,24K-F-D	RL 083.0661	
R23	RL 0,35W 332 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/3320HM-F-D	RL 083.0255	
R24	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R25	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/5620HM-F-D	RL 083.0461	
R26	RL 0,35W 150 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1500HM-F-D	RL 082.9942	
R27	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/6810HM-F-D	RL 083.0490	
R28	RL 0,35W 18,2KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/18,2K-F-C	RL 083.1480	
R29	RL 0,35W 150 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1500HM-F-D	RL 082.9942	
R30	RL 0,35W 562 OHM+-1%TK50	RL 083.0461	

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11	0184	ED SYNTHESIZER SYNTHESIZER	344.0515 SA	4

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	RESISTOR		
	DRALORIC SMA0207/5620HM-F-D		
R31	RL 0,35W 2,21KOHM+-1%TK50	RL 082.2477	
	RESISTOR		
	DRALORIC SMA 0207/2,21K-F-D		
R32	RL 0,35W 7,50KOHM+-1%TK50	RL 083.1197	
	RESISTOR		
	DRALORIC SMA0207/7,5K-F-D		
R33	RL 0,35W 475 OHM+-1%TK50	RL 083.0390	
	RESISTOR		
	DRALORIC SMA0207/4750HM-F-D		
V1	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V2	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V3	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V4	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V5	AK BSX29 PNP 12V 200MA	AK 010.3031	
	TRANSISTOR		
	SGS BSX29		
V6	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V7	AK 2N2369A NPN 40V 200MA	AK 010.4680	
	TRANSISTOR		
	VALVO 2N2369A		
V10	AE BZX79/C3V3 0,5W Z-DI	AE 012.2390	
	ZENER DIODE		
	ITT ZPD3,3		
V11	AD 1N4448 75V 0,15A UDI	AD 012.0700	
	DIODE		
	VALVO 1N4448		
X141	FP WINKELSTECKERLEIST.36P	FP 243.3578	
	CONNECTOR		
	BERG 75168-113-36		
	4-POLIG		
X150	STECKEREINHEIT	344.0809	
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		344.0515	SA BL 4-

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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
05	0683	TTL-DATA DRIVER A TTL-DATA DRIVER A	344.0915 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17	CE 092.4466	344.1157
	ELECTROLYTIC CAPACITOR		
	ROEDERST EBS 10/40 6X17		
C2	CC 220NF+-10%50V7K1200VIE	CC 084.5515	344.1157
	CERAMIC CAPACITOR		
	AEROVOX CKR06BX224KL		
C3	CC 220NF+-10%50V7K1200VIE	CC 084.5515	344.1157
	CERAMIC CAPACITOR		
	AEROVOX CKR06BX224KL		
D1	:: 74F241 / 1KSL/WK	344.7332	344.1157
D2	BL SN54368AJ 6XINV-TREIB.	BL 262.3463	344.1157
	IC 6XINV.DRIVER		
	TEXAS SN54368AJ		
D3	BL SN54368AJ 6XINV-TREIB.	BL 262.3463	344.1157
	IC 6XINV.DRIVER		
	TEXAS SN54368AJ		
H1	EF T1 5V 115MA M.STIFTEN	344.0796	344.1157
	LAMP		
	MGG MGG 1150-8		
BIS/TO H8			
L1	LD 33,0UH10%3,400HM0,130A	LD 067.3047	344.1157
	CHOKE		
	DELEVAN DROSSEL 1025-56		
BIS/TO L8			
R1	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R2	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R3	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R4	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R5	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R6	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R7	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R8	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
	DRALORIC SMA0207/2740HM-F-D		
R9	RL 0,25W 274 OHM+-1%TK50	RL 083.0178	344.1157
	RESISTOR		
		344.0915	SA BL 1+

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DRALORIC SMA0207/2740HM-F-D		
R10	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R11	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R13	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R14	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R15	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R16	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
R17	RL 0,25W 475 OHM+-1%TK50 RESISTOR	RL 083.0390	344.1157
	DRALORIC SMA0207/4750HM-F-D		
V1	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V2	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V3	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V4	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V5	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V6	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V7	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V8	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V9	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V10	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DIODE		
	VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V13	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V14	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V15	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
V16	AD BAV10 60V 0,3 A UDI DIODE	AD 012.9437	344.1157
	VALVO BAV10		
W1	DG VERB.KABEL M.MIRKO-D-S CABLE	344.1028	
	BINDER 955-0-70-1002-01-25		
X1	FP STIFTLEISTE 11 POL CONNECTOR	344.0996	344.1157
	BINDER 10-9875-00-11		
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AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
05	0683	TTL-DATA DRIVER B TTL-DATA DRIVER B	344.0921 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1157
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
C3	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
D1	:: 74F241 / 1KSL/WK	344.7332	344.1157
D2	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
D3	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1157
BIS/TO H8			
L1	LD 33,0UH10X3,400HM0,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047	344.1157
BIS/TO L8			
R1	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R2	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R3	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R4	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R5	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R6	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R7	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R8	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR	RL 083.0178	344.1157

344.0921 SA BL 1+

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AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
05	0683	TTL-DATA DRIVER B TTL-DATA DRIVER B	344.0921 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DRALORIC SMA0207/2740HM-F-0		
R10	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R11	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R13	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R14	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R15	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R16	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R17	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157

344.0921 SA BL 2+

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05	0683	TTL-DATA DRIVER B TTL-DATA DRIVER B	344.0921 SA	3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DIODE VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V13	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V14	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V15	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V16	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
W1	DG VERB.KABEL M.MIRKO-D-S CABLE PINDER 955-0-70-1002-01-25	344.1028	
X1	FP STIFTLEISTE 11 POL CONNECTOR BINDER 10-9875-00-11	344.0996	344.1157
			- ENDE -
		344.0921	SA BL 3-

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ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
05	0683	TTL-DATA DRIVER C TTL-DATA DRIVER C	344.0938 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1157
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
C3	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
D1	:: 74F241 / 1KSL/WK	344.7332	344.1157
D2	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
D3	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1157
BIS/TO H8			
L1	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047	344.1157
BIS/TO L8			
R1	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R2	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R3	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R4	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R5	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R6	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R7	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R8	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR	RL 083.0178	344.1157
		344.0938	SA BL 1+

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DRALORIC SMA0207/2740HM-F-0		
R10	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R11	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R13	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R14	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R15	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R16	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R17	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157

Für diese Unterlage behalten wir uns alle Rechte vor

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DIODE VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V13	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V14	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V15	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V16	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
W1	DG VERB.KABEL M.MIRKO-D-S CABLE BINDER 955-0-70-1002-01-25	344.1028	
X1	FP STIFTLEISTE 11 POL CONNECTOR BINDER 10-9875-00-11	344.0996	344.1157
			- ENDE -

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1157
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
C3	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
D1	:: 74F241 / 1KSL/WK	344.7332	344.1157
D2	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
D3	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1157
BIS/TO H8			
L1	LD 33,0UH10%3,400HMD,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047	344.1157
BIS/TO L8			
R1	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R2	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R3	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R4	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R5	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R6	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R7	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R8	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR	RL 083.0178	344.1157

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Kennzeichen Component No	Benennung/Beschreibung Designation	Sachnummer Stock No	enthalten in contained in
	DRALORIC SMA0207/2740HM-F-0		
R10	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R11	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R13	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R14	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R15	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R16	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R17	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157

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AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
05	0683	TTL-DATA DRIVER D TTL-DATA DRIVER D	344.0944 SA	3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DIODE VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V13	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V14	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V15	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V16	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
W1	DG VERB.KABEL M.MIKKO-D-S CABLE BINDER 955-0-70-1002-01-25	344.1028	
X1	FP STIFTLEISTE 11 POL CONNECTOR BINDER 10-9875-00-11	344.0996	344.1157
			- ENDE -
		344.0944	SA BL 3-

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AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
08	0683	TTL-CLOCK DRIVER TTL CLOCK DRIVER	344.0950 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1170
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1170
C3	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.1170
C4	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.1170
C5	CC 56PF+-2%4X5N750 CAPACITOR VALVO 2222 678 58569 NICHT BESTUECKT/NOT IN	CC 087.6870	344.1170
D1	:: 74F241 / 1KSL/WK	344.7332	344.1170
D2	BL SN54S00J 4/2INP.NAND IC NAND GATE SN54S00J TEXAS SN54S00J	BL 468.5899	344.1170
D3	BL HEF4049BP 6X INVERT INVERTER VALVO HEF4049BP	BL 347.3350	344.1170
D4	:: 74F241 / 1KSL/WK	344.7332	344.1170
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H2	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H3	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H4	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H5	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H6	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H7	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
L1	LD 0,82UH10%0,850HM0,420A CHOKE DELEVAN DROSSEL1025-18	LD 067.2857	344.1170
L2	LD 0,82UH10%0,850HM0,420A CHOKE DELEVAN DROSSEL1025-18	LD 067.2857	344.1170
L3	LD 0,82UH10%0,850HM0,420A CHOKE	LD 067.2857	344.1170
		344.0950	SA BL 1+

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DELEVAN DROSSEL1025-18		
R1	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R2	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R3	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R4	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R7	RL 0,25W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	344.1170
R8	RL 0,25W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	344.1170
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-D	RL 083.0178	344.1170
R10	RF 0-WIDERSTAND DIN 0207 0-RESISTOR RESISTA SK2,0 OHM	RF 069.0000	344.1170
R11	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R12	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R13	RL 0,25W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	344.1170
R15	RL 0,25W 121KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/121K-F-C	RL 083.2070	344.1170
R16	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F-D	RL 082.9636	344.1170
R17	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F-D	RL 082.9636	344.1170
R18	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F-D	RL 082.9636	344.1170
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V11	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V12	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V13	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V14	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
W1	DG VERB.KABEL M.MIRKO-D-S CABLE BINDER 955-0-70-1002-01-25	344.1028	
X1	FP STIFTLEISTE 11 POL CONNECTOR BINDER 10-9875-00-11	344.0996	344.1170
			- ENDE -

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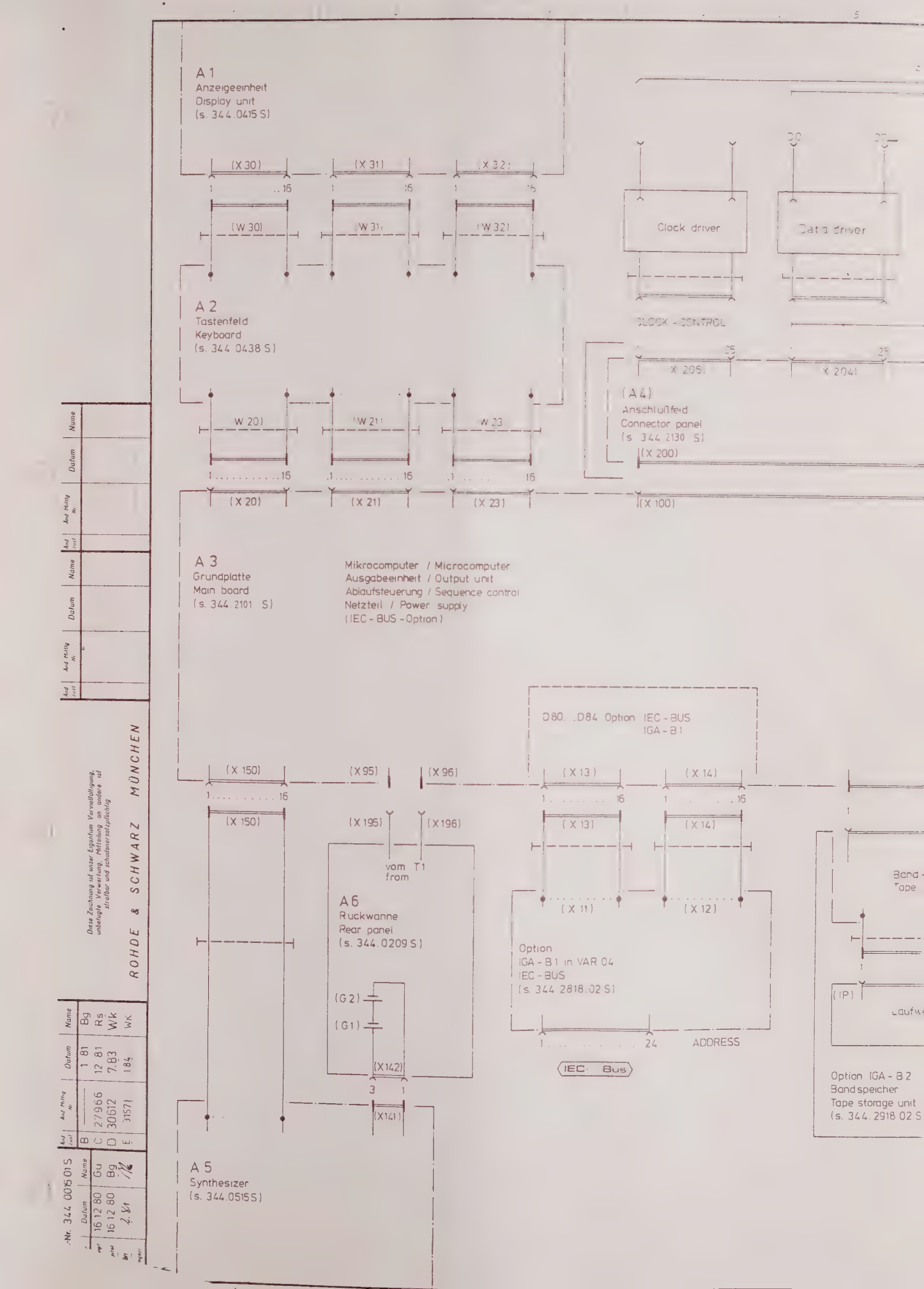
MÜNCHEN

Stromläufe
Bestückungspläne
Circuit diagrams
Components plans

R 29500 Bl. 4



Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig
ROHDE & SCHWARZ MÜNCHEN

Änd zust	Änd Mitteilg Nr	Datum	Name
B	—	1 81	Bg
C	27966	12 81	Rs
D	30612	7.83	Wk
E	31571	184	Wk

Nr. 344 0015 01 S

	Datum	Name
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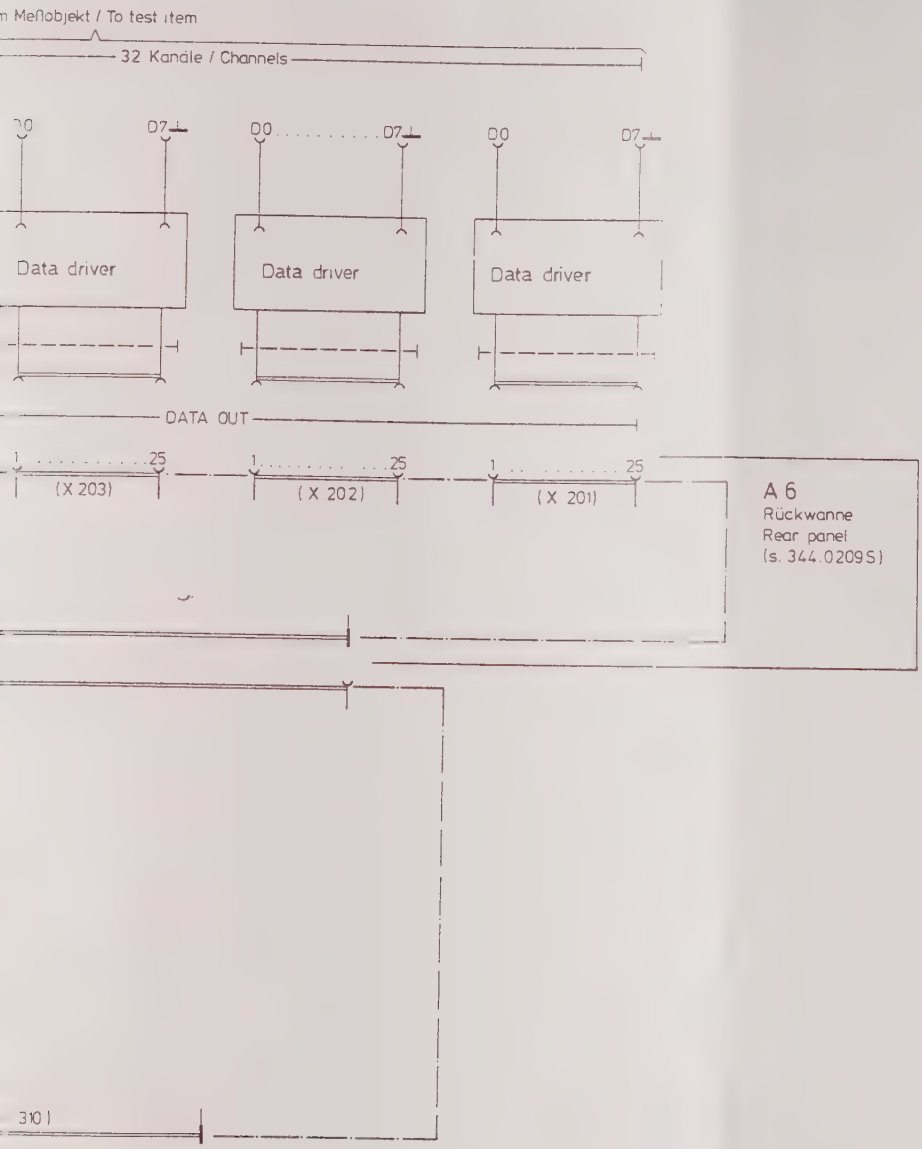
gepr	16 12 80	Bg
Norm	2.81	



Gerätevariante Instrument model	Sachnummer für A 3 Ident. No. for A 3	Sachnummer für A 4 Ident. No. for A 4	Anzahl der Datentreiber Number of data drivers	Anzahl der Clocktreiber Number of clock drivers	Ausführung Version
344.0015.04	344 2101 .03	344 2130 .03	0	0	32 Kanäle ohne Treiber mit Opt. IGA-B1 32 Channels without drivers with option IGA-B1

0 1 2 3
ZENTIMETER

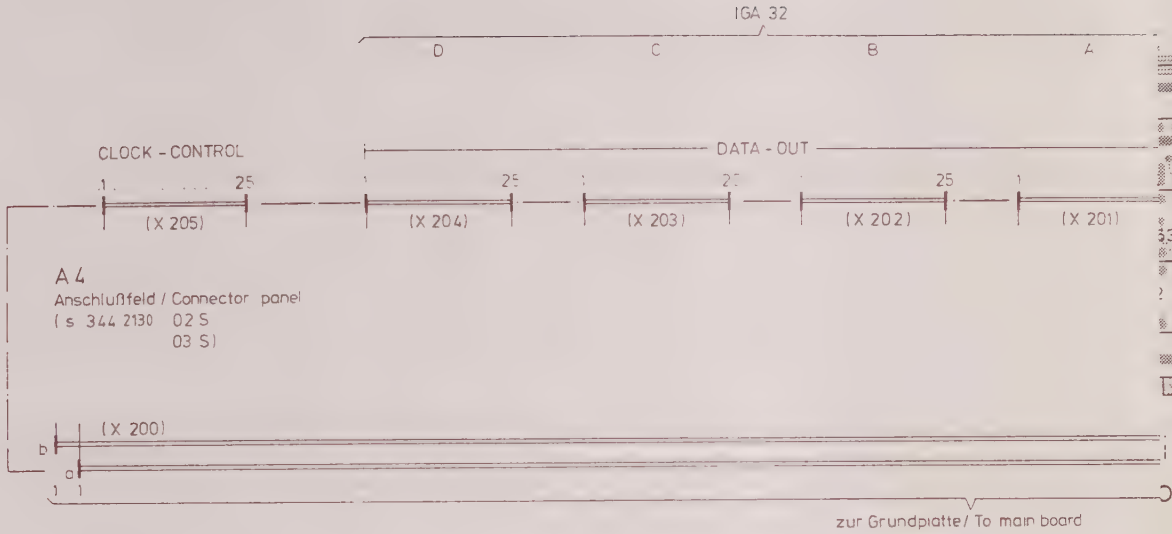
Stromlauf zu

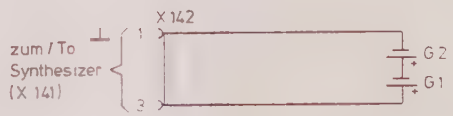
Logic - Generator IGA

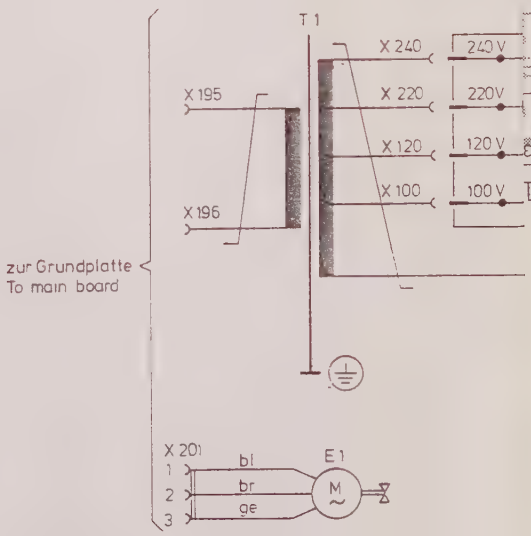
Z

Zeichn. Nr. 344.0015.01 S

344.0015 V







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Änd. zust.	Änd. Mitteilg. Nr.	Datum	Name
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B	31571	0184	WK

Zeichn-Nr. 344.C	Datum	Name
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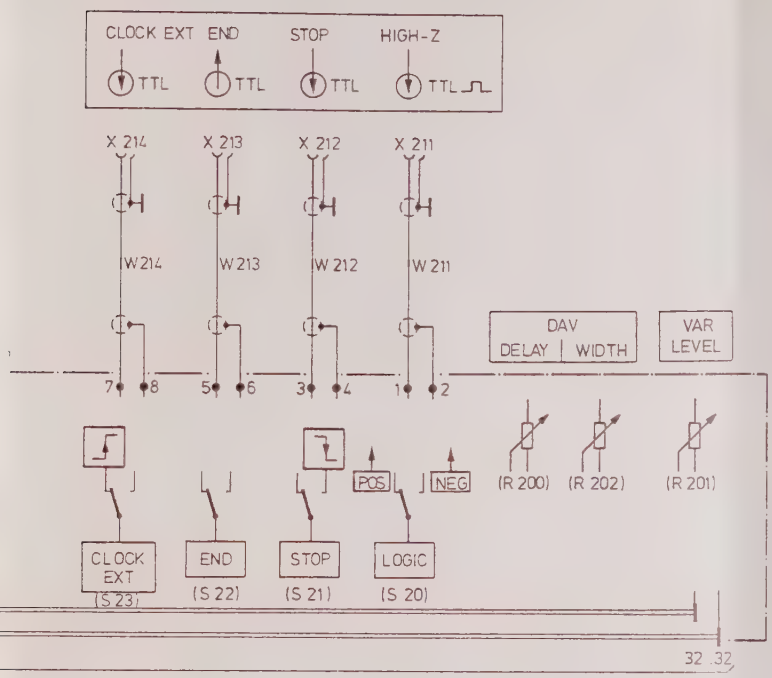
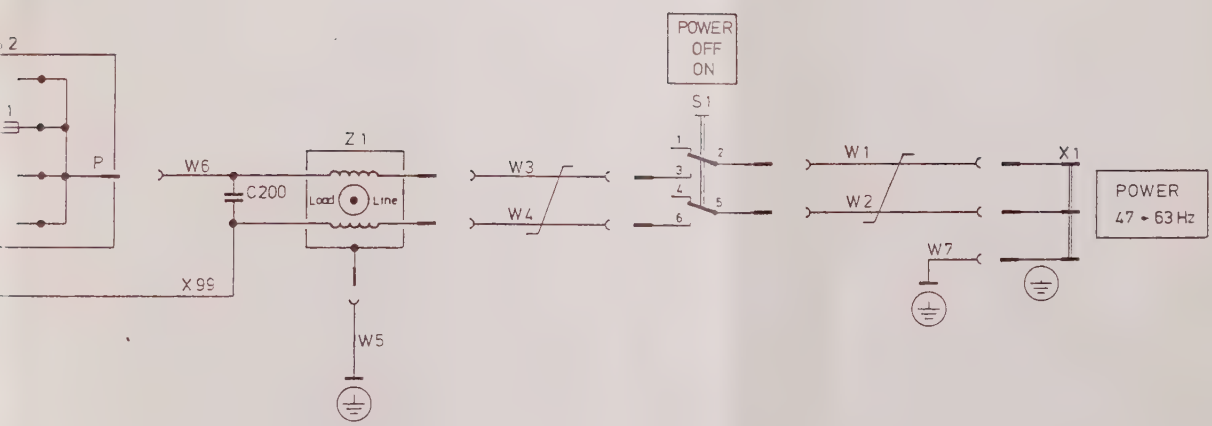
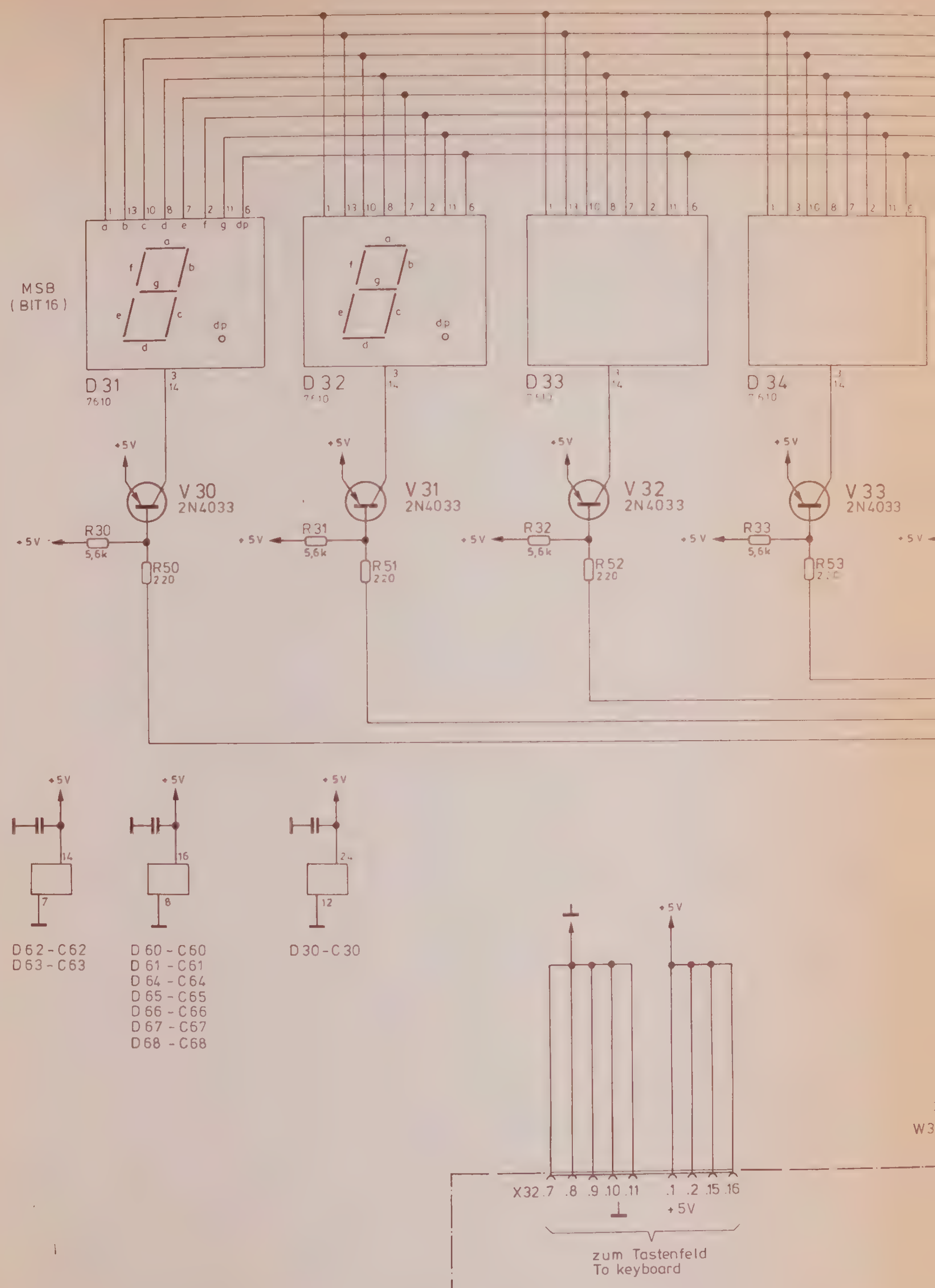
gezeichnet	17 12 80	Bg
bearbeitet		
geprüft	4.84	
freigegeben		





0 1 2 3
ZENTIMETER

Stromlauf zu Rückwand / Rear panel		Z	*Zeichn. Nr.* 344.0209 S
			344.0015 V / 344.0015



Name		
Datum		
Änd Mittlg Nr		
Änd-Zust		

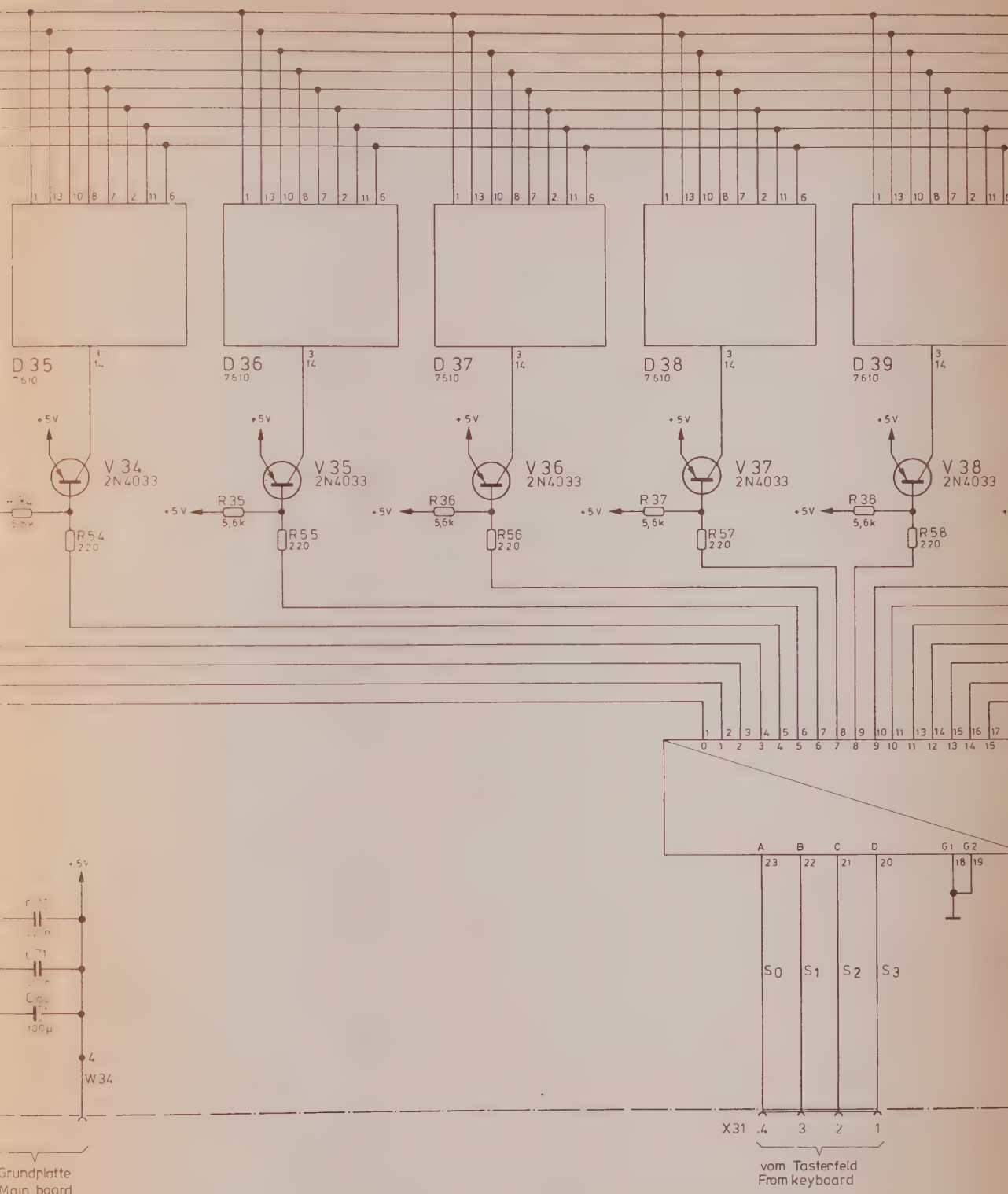
Für diese Zeichnung behalten wir uns alle Rechte vor

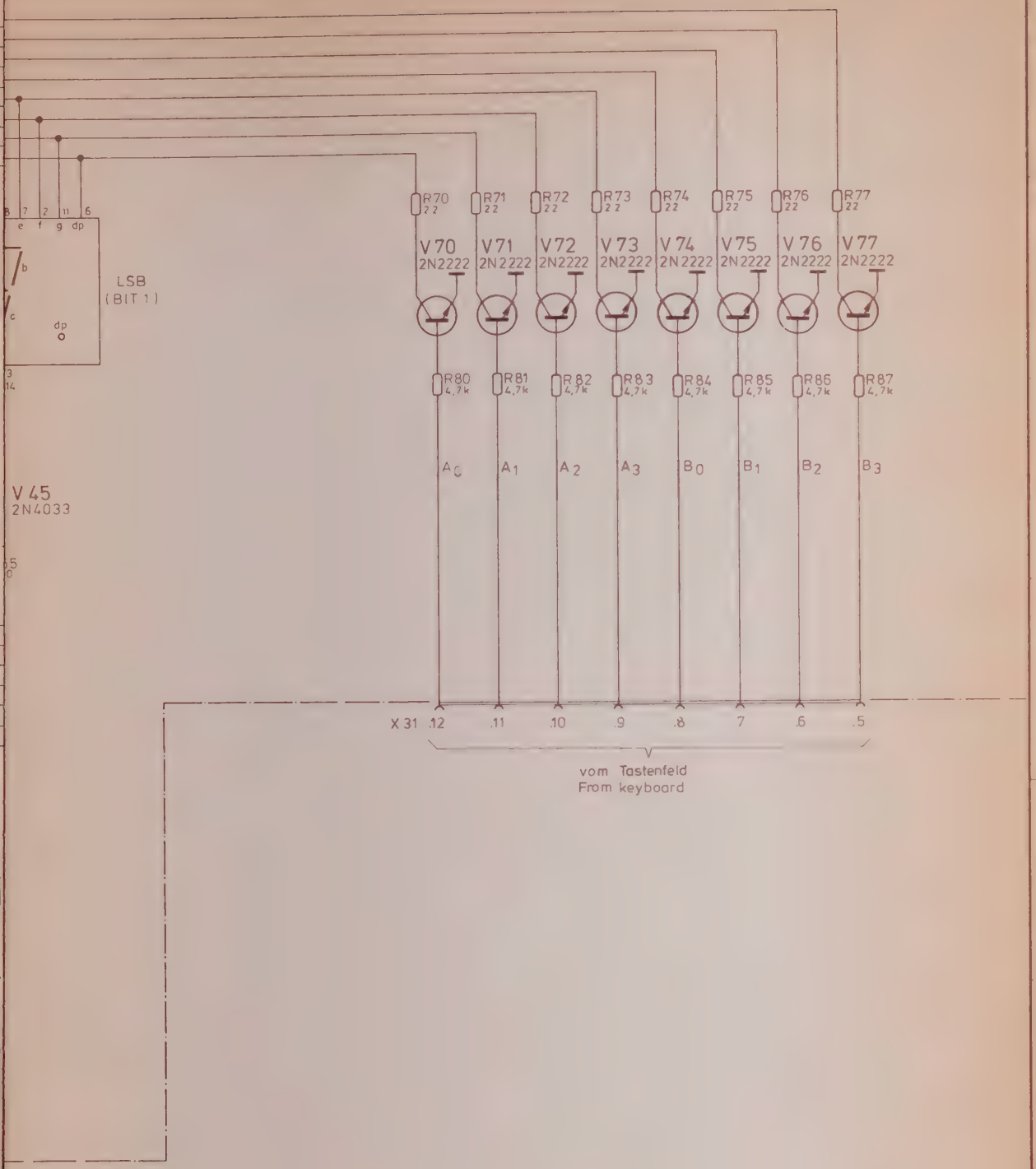
ROHDE & SCHWARZ

Änd-Zust	Änd Mittlg Nr	Datum	Name
A		5 80	Bg
B		10 80	Bg

Zeichn.-Nr.	Datum	Name
1GMA		
gezeichnet	29.11.79	Gu
bearbeitet	29.10.79	Bg
geprüft	12.79	
normgepr		

0 1 2 3 ZENTIMETER


D 35
7610
D 36
7610
D 37
7610
D 38
7610
D 39
7610
+5V
V 34
2N4033
V 35
2N4033
V 36
2N4033
V 37
2N4033
V 38
2N4033
R35
5,6k
R36
5,6k
R37
5,6k
R38
5,6k
R54
220
R55
220
R56
220
R57
220
R58
220
A
B
C
D
G1
G2
S0
S1
S2
S3
W34
X31
vom Tastenfeld
From keyboard
Grundplatte
Main board



Stromlauf zu Anzeigeeinheit / Display unit				Zeichn.-Nr 344.0415 S	Blatt-Nr 1
IGA	reg.-Nr V	344.0015 V	erste Z	344.0015	v 2 B1

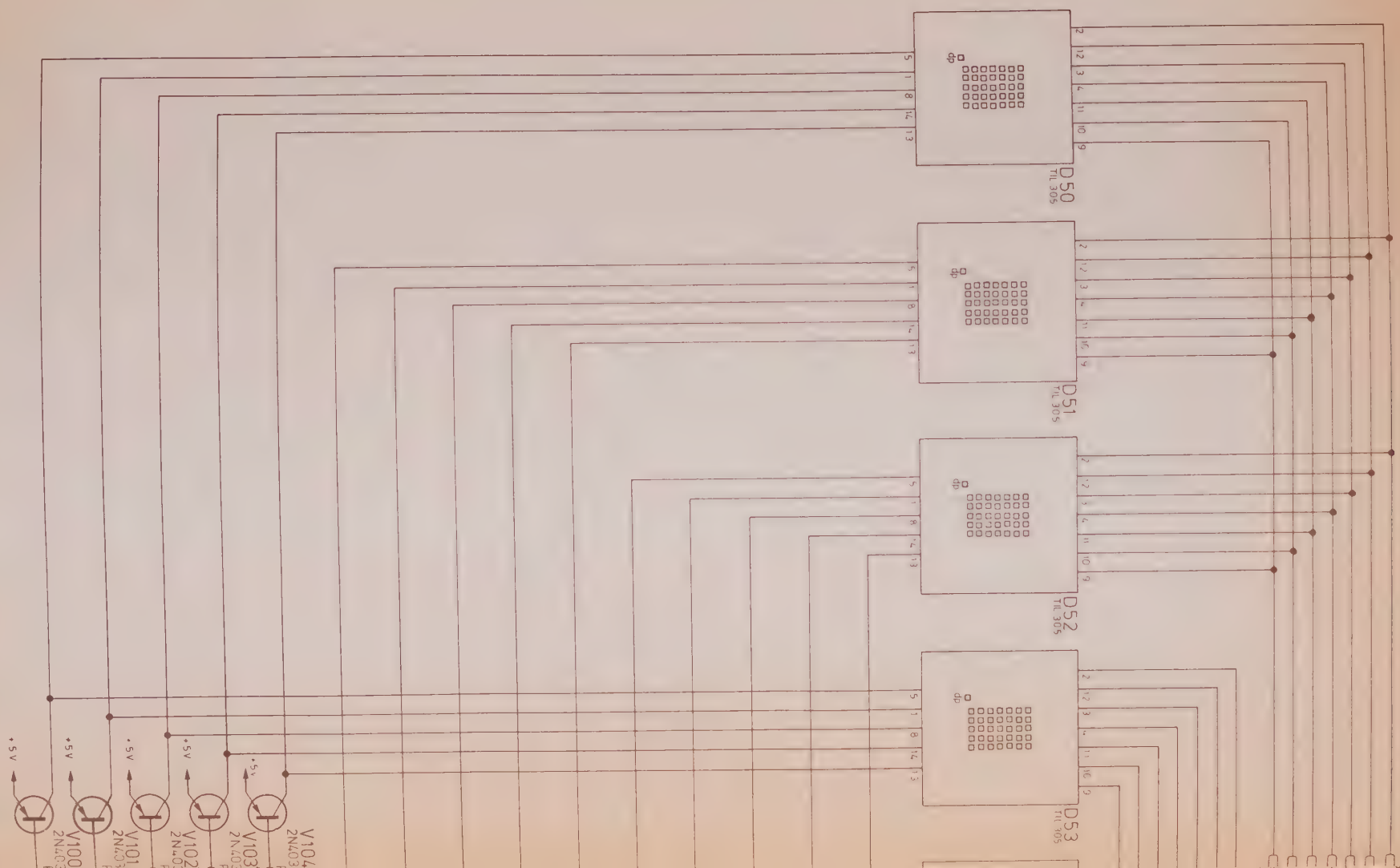
Zeichn.-Nr.			And Zust	And Mittlg Nr	Datum	Name
1 GMA	Datum	Name	A	———	5 80	Bg
gezeichnet	11 79	Gu	B	———	10 80	Bg
bearbeitet	11 79	Bg	C	———	2 81	Bg
geprüft	12 79	Mo	D	27966	11 81	Bg
normgepr			E	30612	07.83	Wk

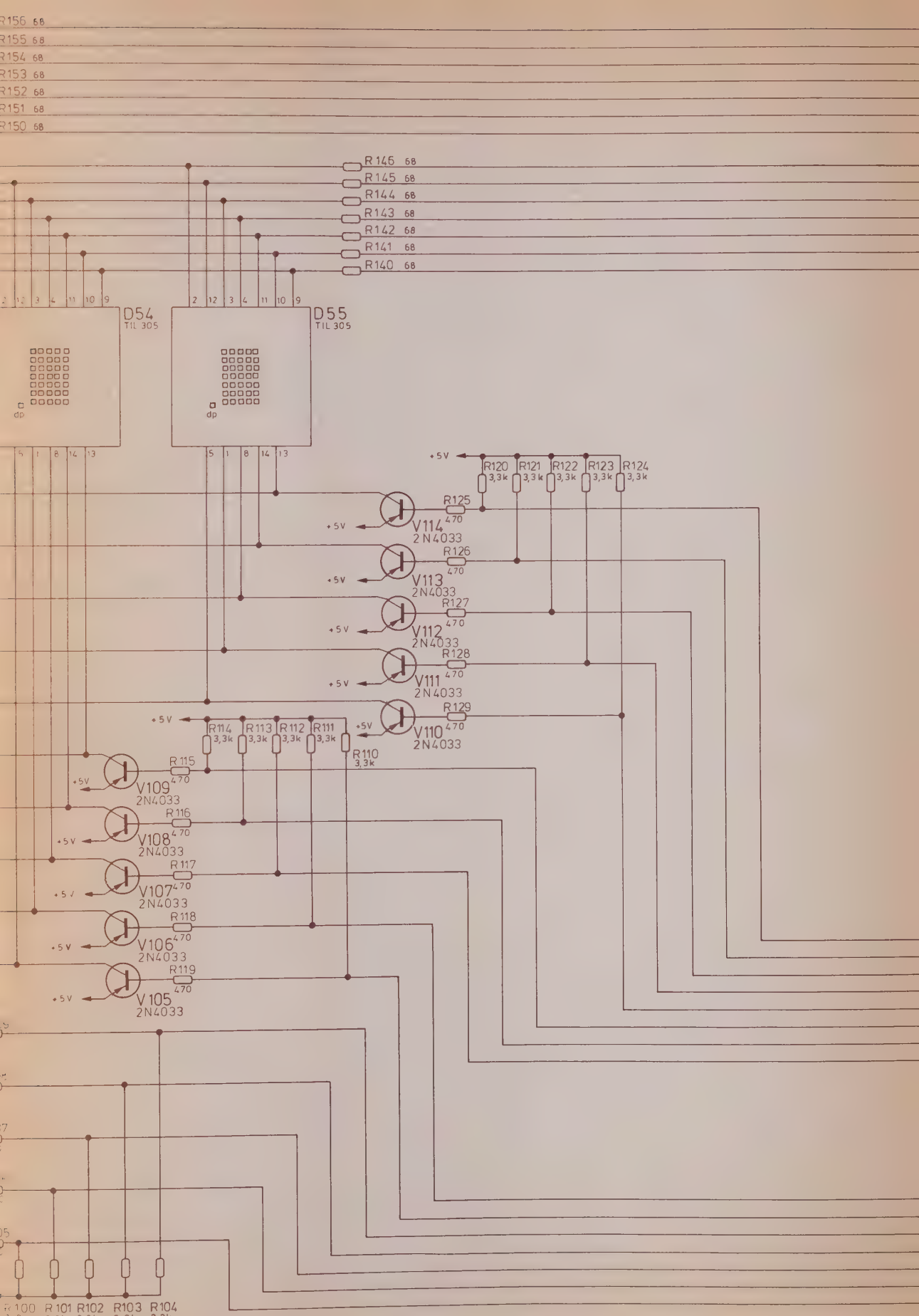
Für diese Zeichnung behalten wir uns alle Rechte vor

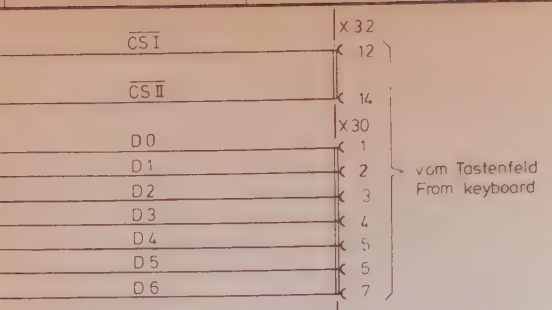
ROHDE&SCHWARZ

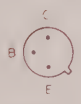
And Zust	And Mittlg Nr	Datum	Name	And Zust	And Mittlg Nr	Datum	Name

0 1 2 3
ZENTIMETER




R156 68
R155 68
R154 68
R153 68
R152 68
R151 68
R150 68
R146 68
R145 68
R144 68
R143 68
R142 68
R141 68
R140 68
D54
TIL 305
D55
TIL 305
dp
dp
+5V
R120 3,3k
R121 3,3k
R122 3,3k
R123 3,3k
R124 3,3k
R125 470
R126 470
R127 470
R128 470
R129 470
V114 2N4033
V113 2N4033
V112 2N4033
V111 2N4033
V110 2N4033
R114 3,3k
R113 3,3k
R112 3,3k
R111 3,3k
R110 3,3k
R115 470
R116 470
R117 470
R118 470
R119 470
V109 2N4033
V108 2N4033
V107 2N4033
V106 2N4033
V105 2N4033
R100 3,3k
R101 3,3k
R102 3,3k
R103 3,3k
R104 3,3k



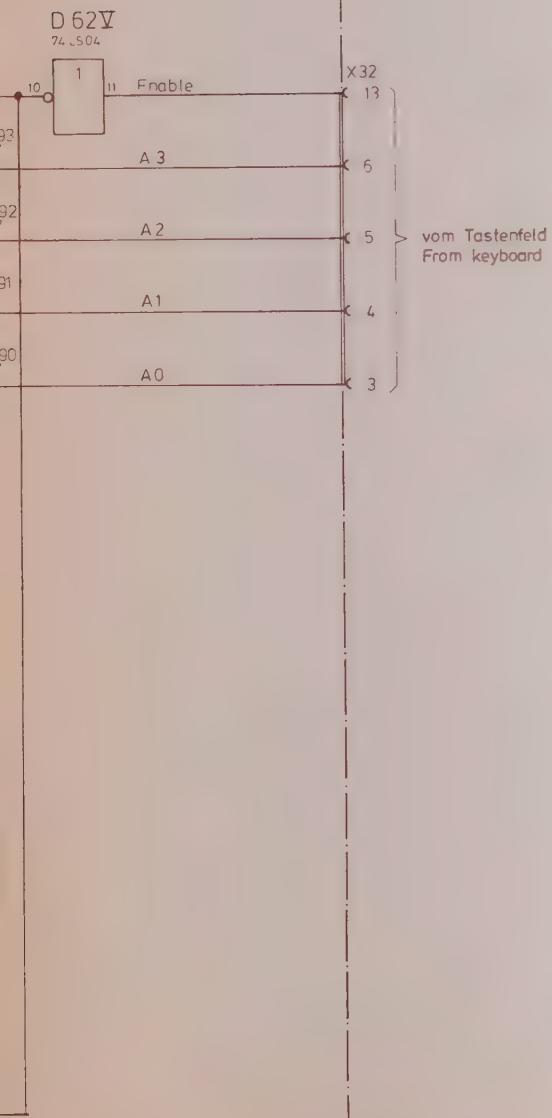


V 100 V 114

D 62, D 63

D 60, D 61, D 64, D 65
D 66, D 67, D 68

D 50 .... D 55



Stromlauf zu

Anzeigeeinheit / Display unit

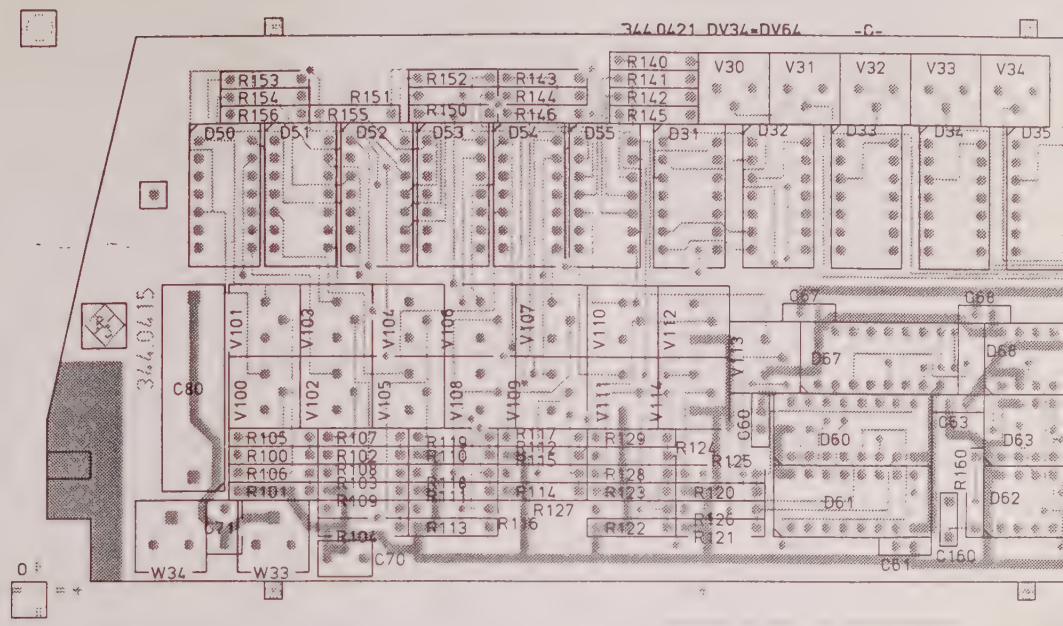
I GA	reg : V	344.0015 V	erste Z	344.0015	

Zeichn.-Nr 344.0415 S

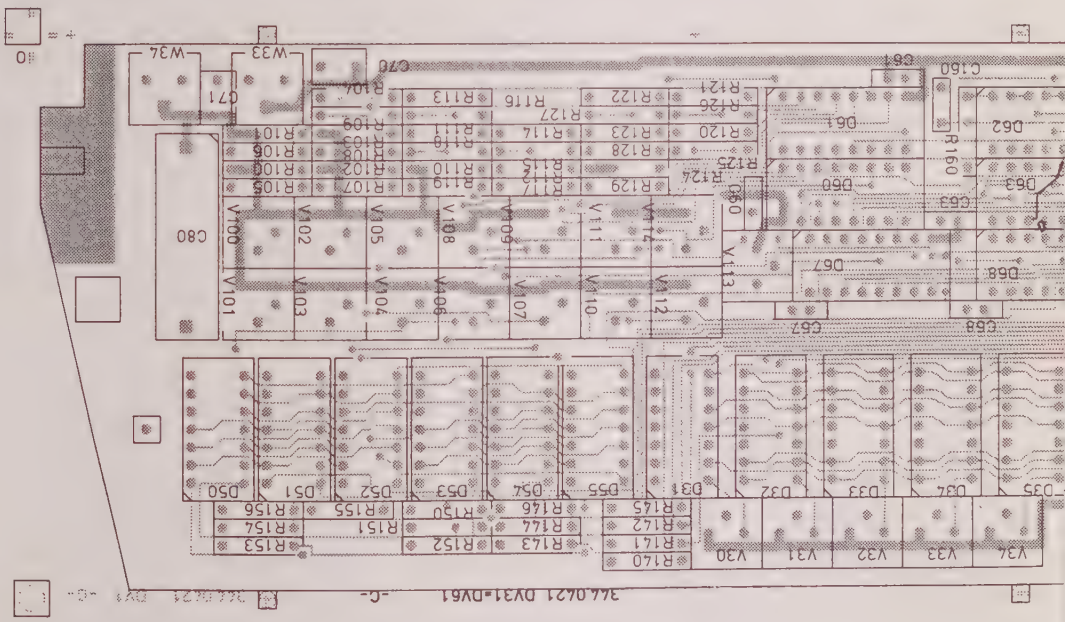
Blatt Nr. 2

v 2 Bl

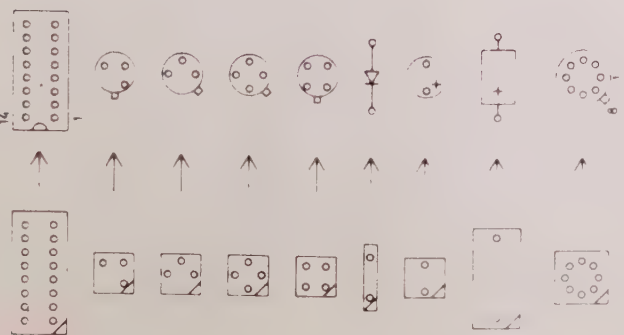
Ansicht und Leitun
View of tracks on c



Ansicht und Leitu
View of tracks on



Symbolschlussel



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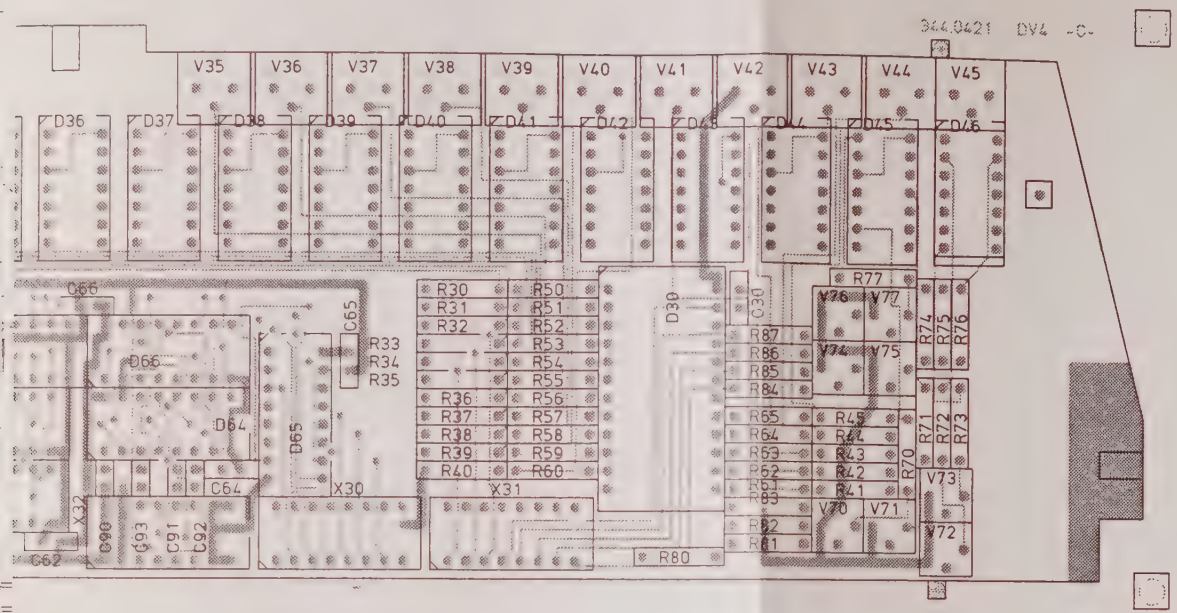
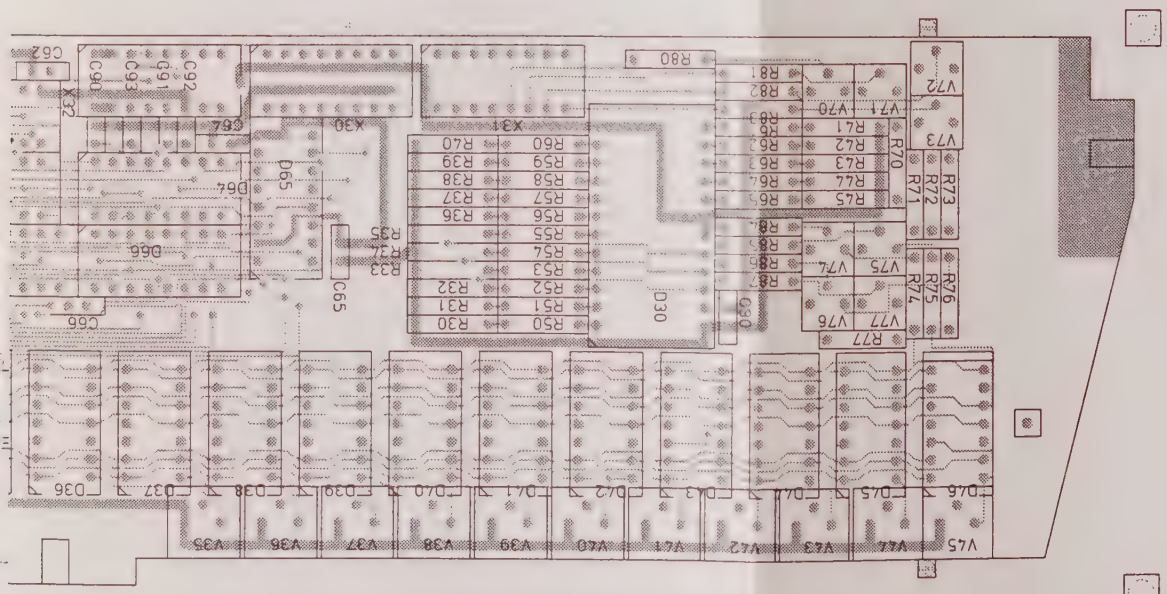
5 6 7 8

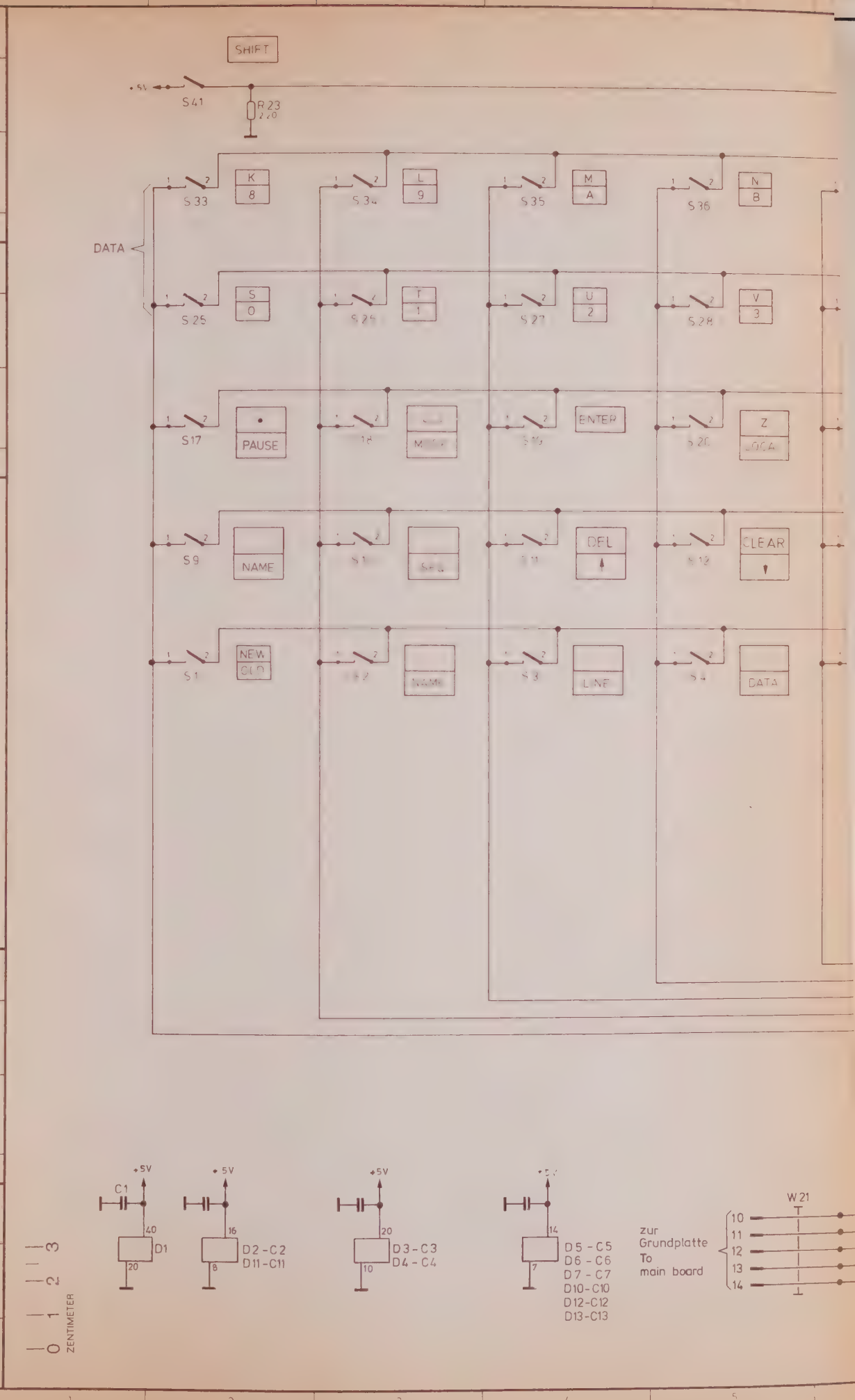
gsführung Bauteilseite
omponent side



ngsführung Lotseite
solder side



Versorg-Nr						VG-Sachnr	
C	27966	12.81	BG	Maße ohne Toleranzangabe		Maßstab 1 : 1	
D	30612	07.83	Wk			Halbzeug, Werkstoff	
				IGM	Tag / Name	Benennung	
				Bearb	12.81 / BG	Anzeigeeinheit DISPLAY UNIT	
				Gepr			
				Norm			
				ROHDE & SCHWARZ MUNCHEN		Zeichn-Nr 344.0415	
And Zust	Anderungs-Mitteilung	Tag	Name	zu Gerat IGA		reg. V 344.0015 V	erste Z 344.00



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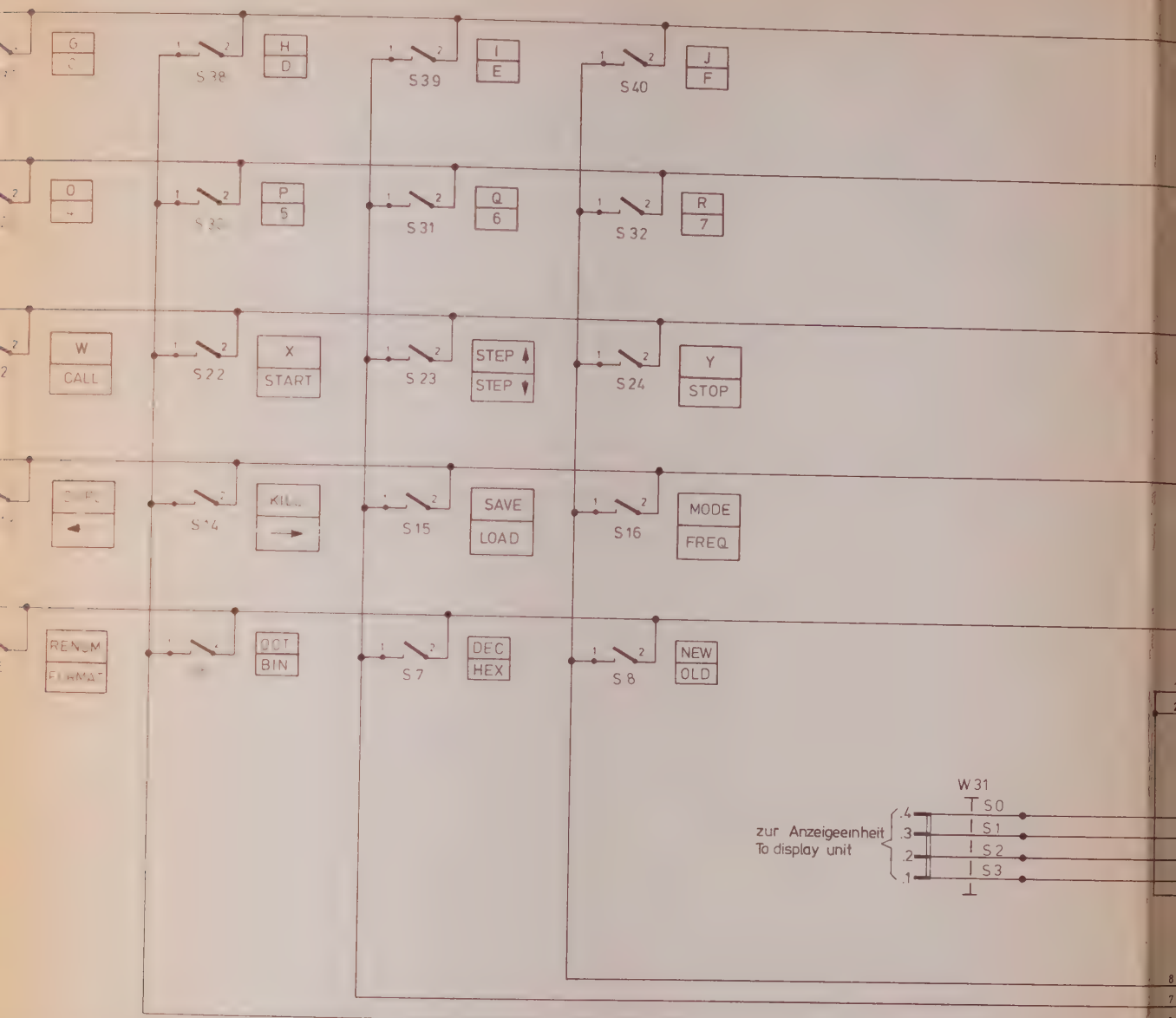
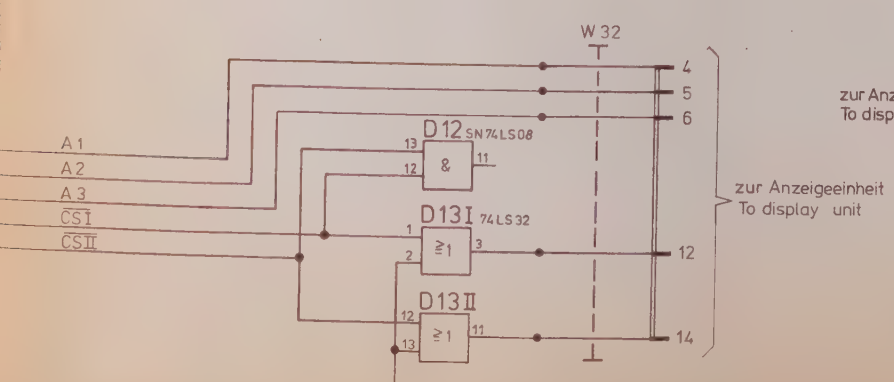
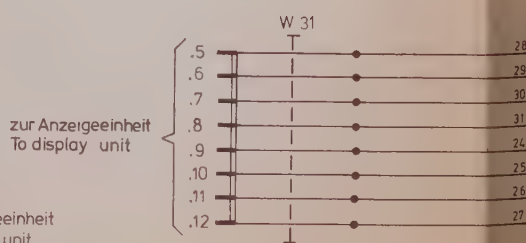
ROHDE&SCHWARZ

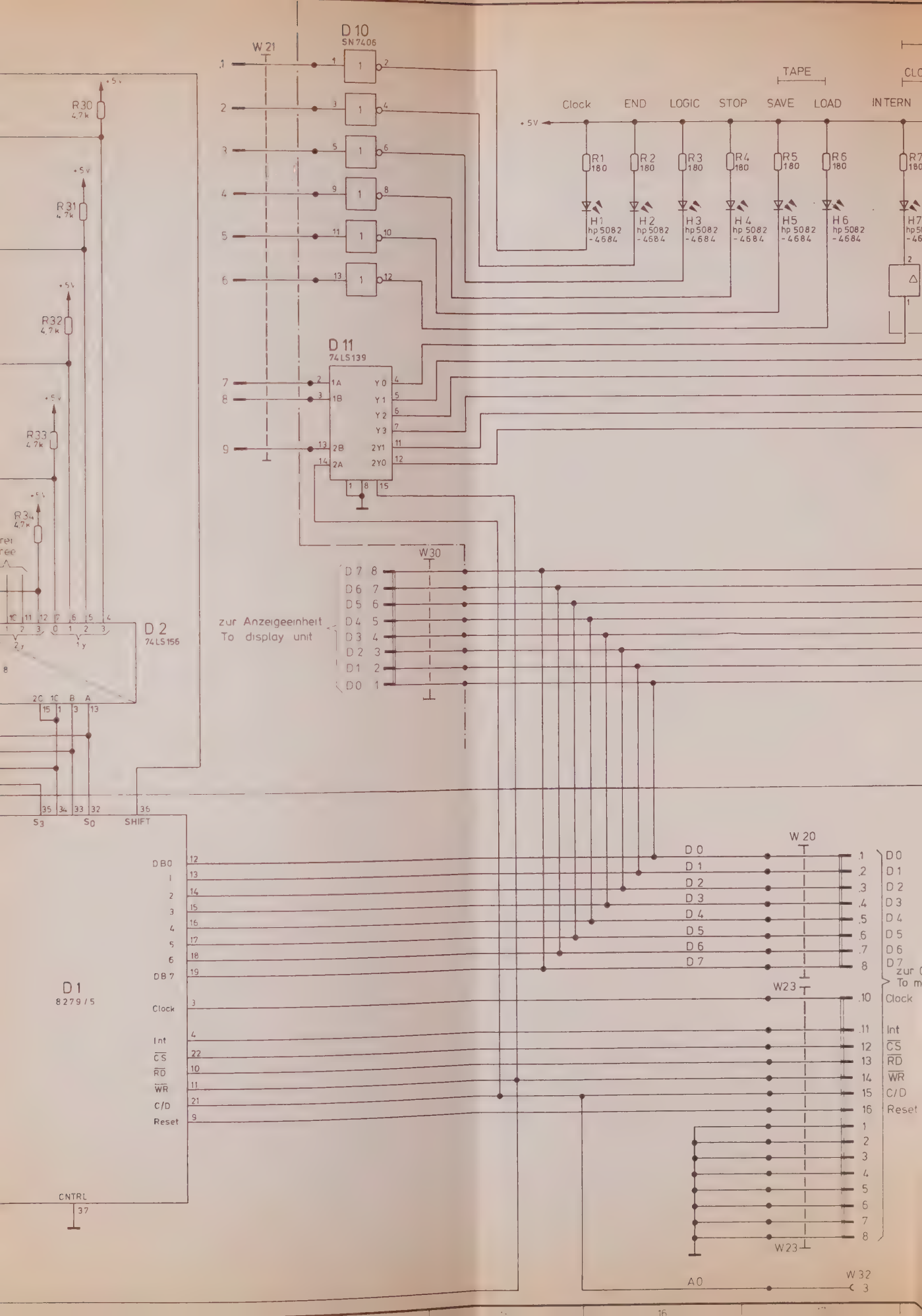
Zeichn.-Nr.							
1 GMA	Datum	Name					
gezeichnet	26.12.79	Gu	A		19.6.80	Bg	
bearbeitet	20.12.79	Bg	B		10.80	Bg	
geprüft	12.79		C	27966	11.81	Bg	
normgepr			D	30612	07.83	Wk	

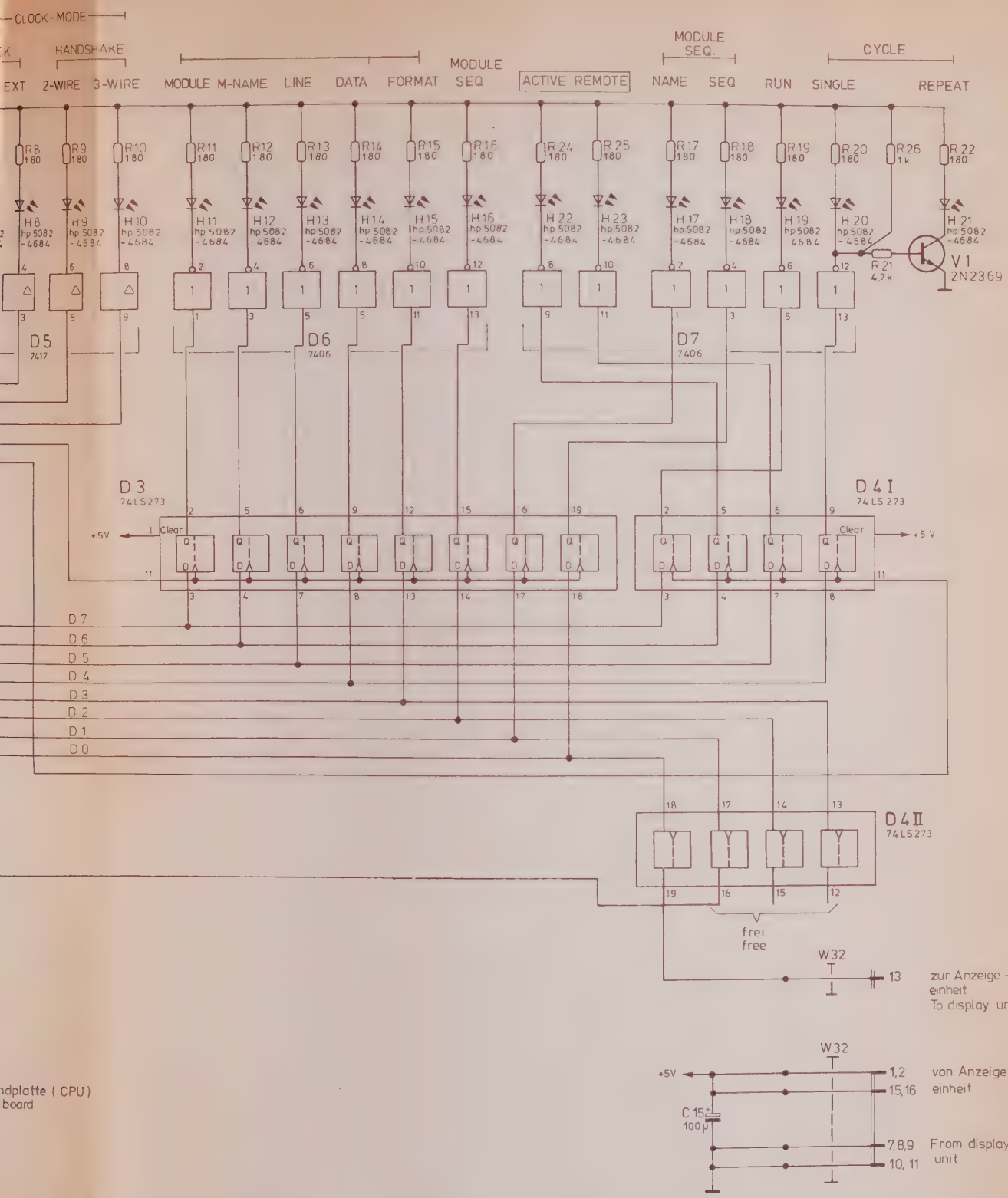
PFO 95 3531-0379


G
C
S 38
H
D
S 39
I
E
S 40
J
F
O
P
5
S 31
Q
6
S 32
R
7
W
CALL
S 22
X
START
S 23
STEP
STEP
S 24
Y
STOP
S 14
KIL
S 15
SAVE
LOAD
S 16
MODE
FREQ
RENUM
FORMAT
OCT
BIN
S 7
DEC
HEX
S 8
NEW
OLD
W 31
S0
S1
S2
S3
.4
.3
.2
.1
zur Anzeigeeinheit
To display unit


W 32
A 1
A 2
A 3
CS I
CS II
D12 SN 74LS08
13
12
&
11
D13 I 74LS32
1
2
≧1
3
D13 II
12
13
≧1
11
4
5
6
12
14
zur Anzeigeeinheit
To display unit

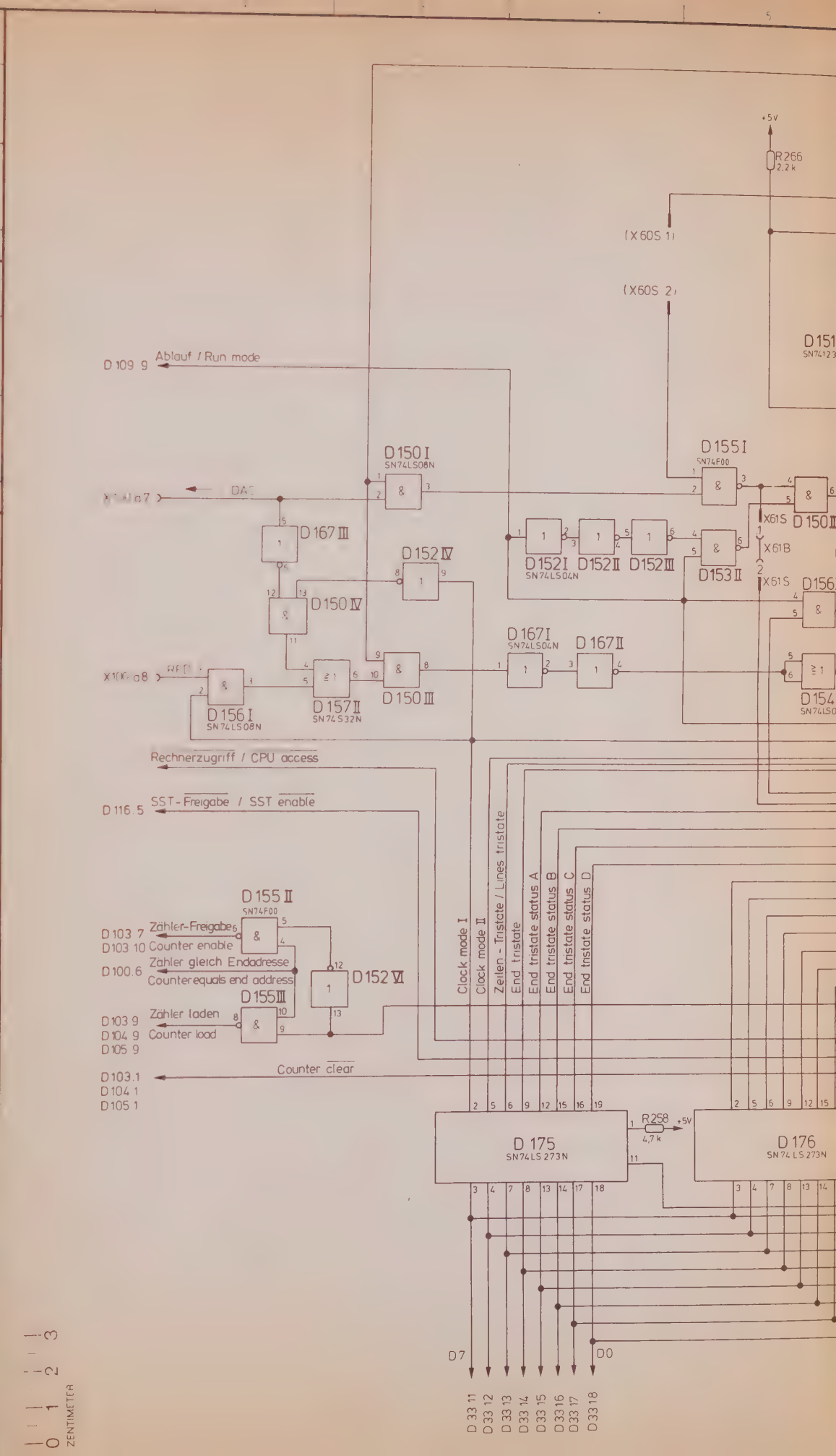

W 31
.5
.6
.7
.8
.9
.10
.11
.12
zur Anzeigeeinheit
To display unit


D 10
SN 7406
W 21
TAPE
Clock
END
LOGIC
STOP
SAVE
LOAD
INTERN
+5V
R1 180
R2 180
R3 180
R4 180
R5 180
R6 180
H1 hp 5082 - 4684
H2 hp 5082 - 4684
H3 hp 5082 - 4684
H4 hp 5082 - 4684
H5 hp 5082 - 4684
H6 hp 5082 - 4684
D 11
74LS139
1A
1B
2B
2A
Y0
Y1
Y2
Y3
2Y1
2Y0
W30
D7 8
D6 7
D5 6
D4 5
D3 4
D2 3
D1 2
D0 1
zur Anzeigeeinheit
To display unit
R30 4.7k
R31 4.7k
R32 4.7k
R33 4.7k
R34 4.7k
D 2
74LS156
2C 1C B A
S3
S0
SHIFT
D1
8279/5
DB0
DB7
Clock
Int
CS
RD
WR
C/D
Reset
CNTRL
W 20
W23
W32
A0
D0
D1
D2
D3
D4
D5
D6
D7
zur
To m
Clock
Int
CS
RD
WR
C/D
Reset

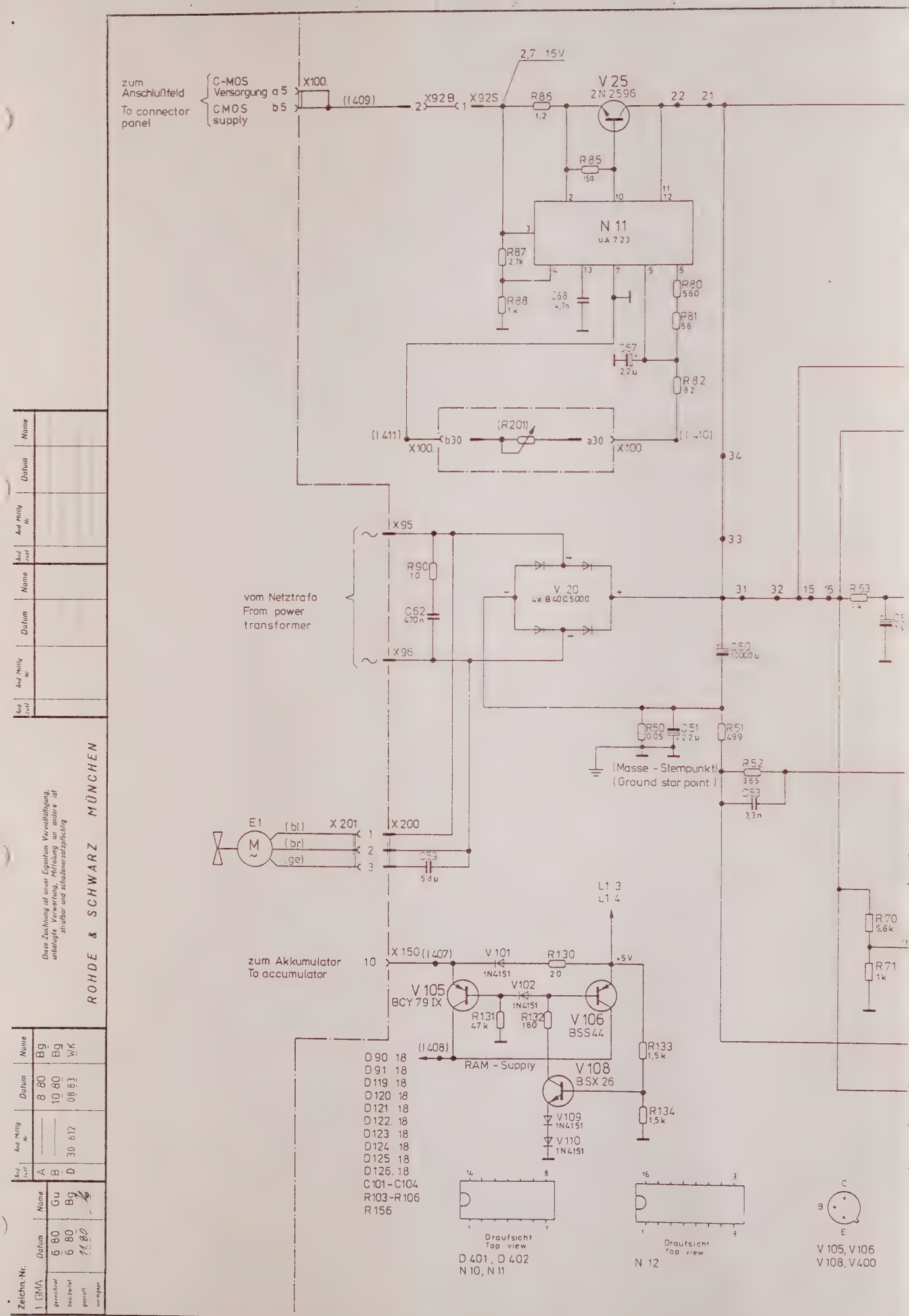


ndplatte (CPU)
board

Stromlauf zu: Tastenfeld / Keyboard			Z	Zeichn.-Nr: 344.0438 S	Blatt-Nr:
IGA	reg. v: 344.0015 V	erste Z.: 344.0015			v B



+5V
R266
2,2 k
(X60S 1)
(X60S 2)
D151
SN74123
D109 9
Ablauf / Run mode
D150 I
SN74LS08N
D155 I
SN74F00
DAC
D167 III
D152 IV
D150 IV
D152 I
SN74LS04N
D152 II
D152 III
D153 II
X61S
X61B
D150 II
D156
D167 I
SN74LS04N
D167 II
D156 I
SN74LS08N
D157 II
SN74S32N
D150 III
D154
Rechnerzugriff / CPU access
D116.5
SST-Freigabe / SST enable
D155 II
SN74F00
D103 7
Zähler-Freigabe
D103 10
Counter enable
D100.6
Zähler gleich Endadresse
Counterequals end address
D152 VI
D155 III
D103 9
Zähler laden
D104 9
Counter load
D105 9
D103.1
D104 1
D105 1
Counter clear
Clock mode I
Clock mode II
Zeilen - Tristate / Lines tristate
End tristate
End tristate status A
End tristate status B
End tristate status C
End tristate status D
D 175
SN74LS273N
R258
4,7 k
+5V
D 176
SN74LS273N
D7
D0
D33 11
D33 12
D33 13
D33 14
D33 15
D33 16
D33 17
D33 18
ZENTIMETER
0 1 2 3
ROHDE & SCHWARZ



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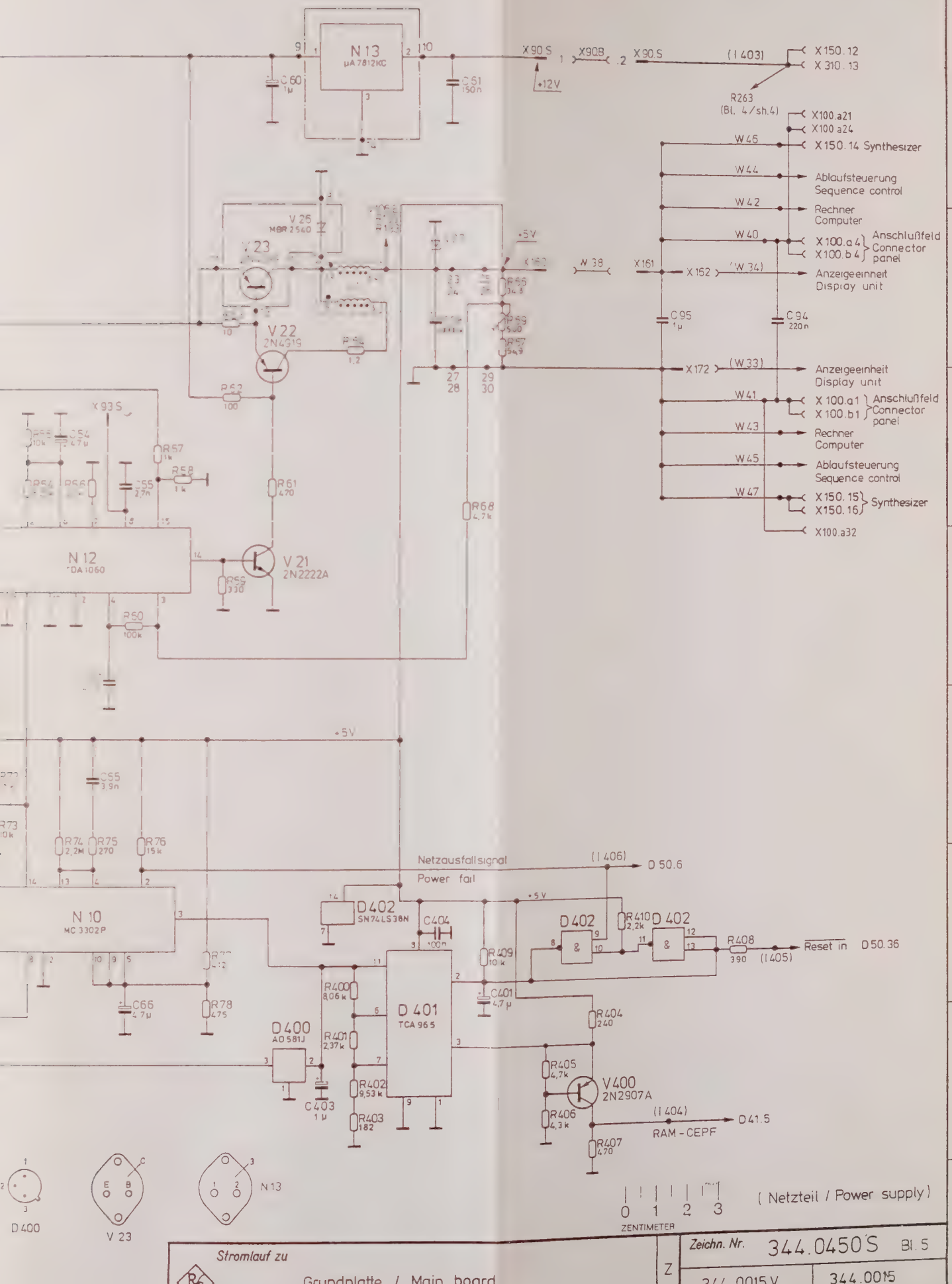
ROHDE & SCHWARZ MÜNCHEN

Änd. zust.	Änd. Mitteilg. Nr.	Datum	Name
A	—	8 80	Bg
B	—	10 80	Bg
D	30 612	08 83	WK

Zeichn.-Nr.	Datum	Name
1 GMA	6 80	Gu
gezeichnet	6 80	Bg
bearbeitet	11 80	
geprüft		
ausgegeben		



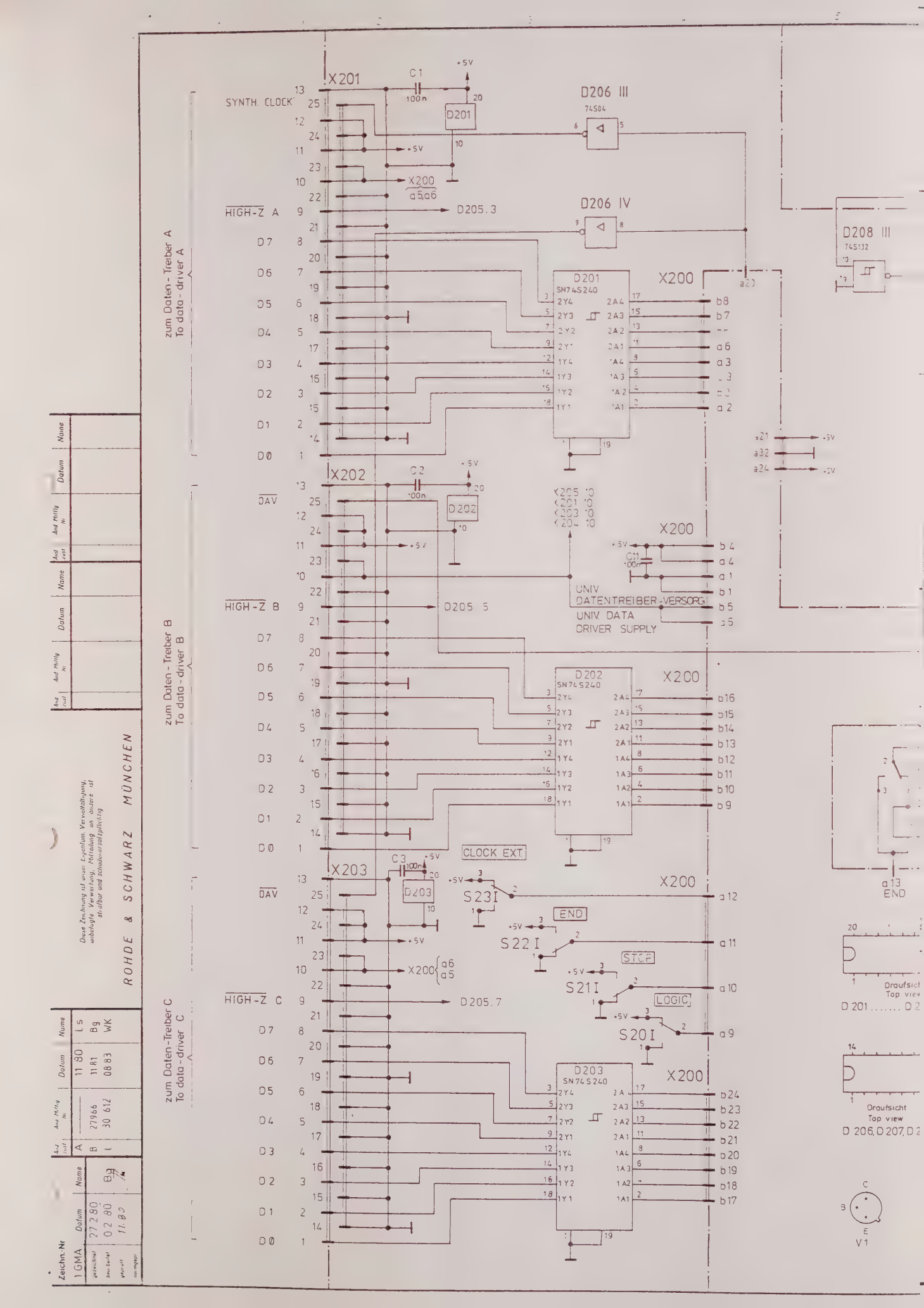
Stromlauf zu

Grundplatte / Main board

Z

Zeichn. Nr. 344.0450 S Bl. 5

344.0015 V | 344.0015



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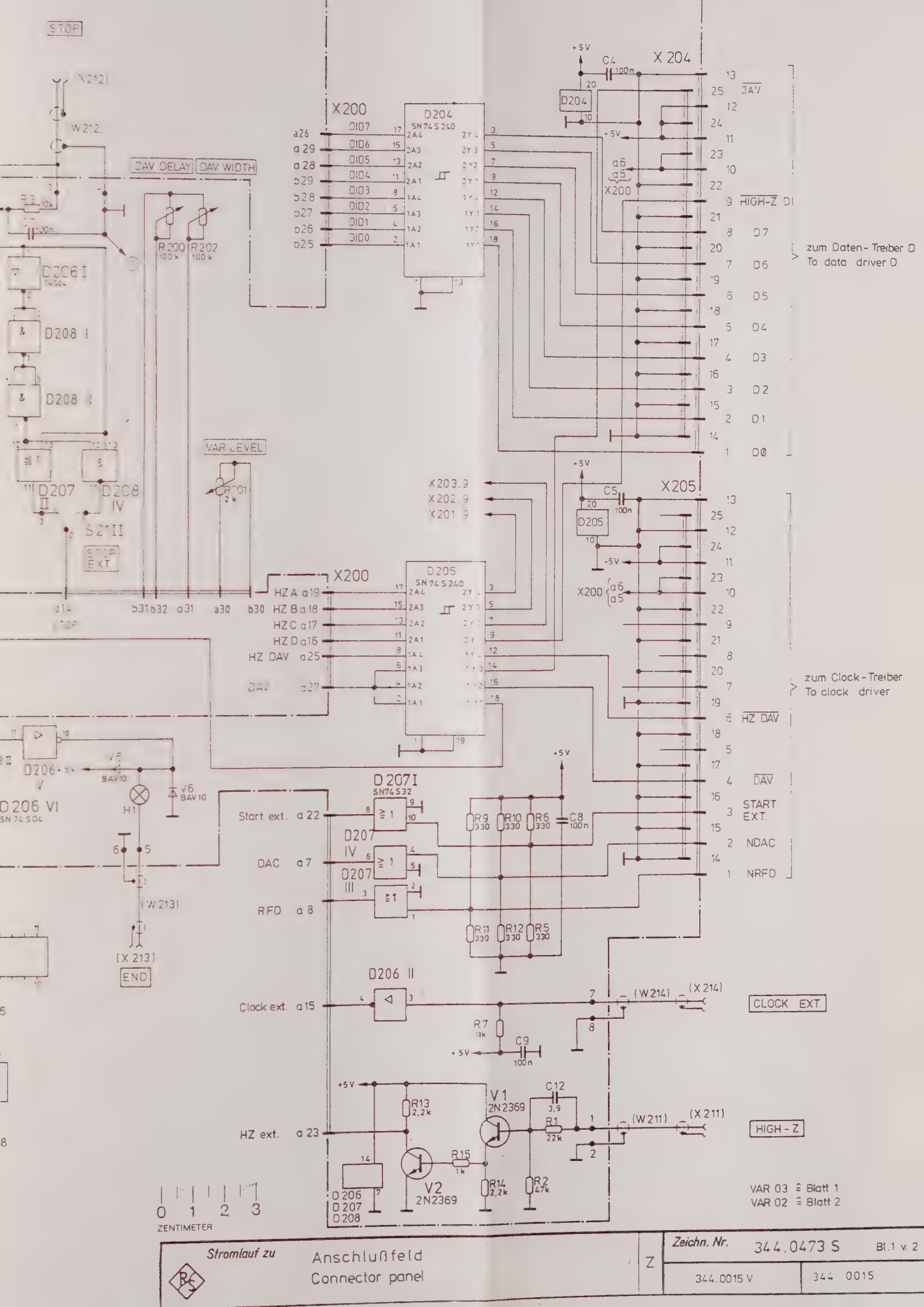
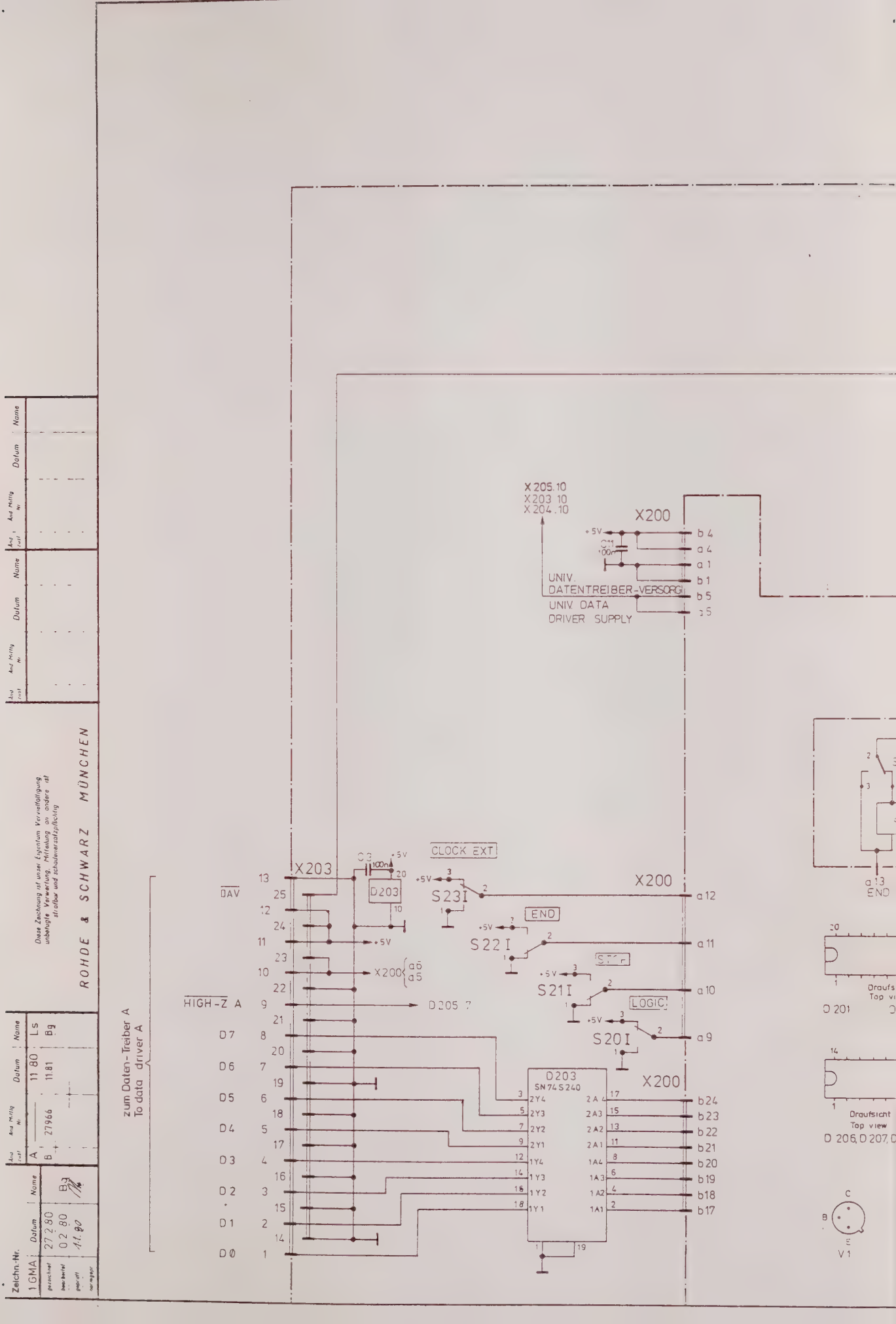
ROHDE & SCHWARZ MÜNCHEN

Änd. Zust.	Änd. Mitteilg. Nr.	Datum	Name
A	———	11 80	L s
B	27966	11 81	Bg
I	30 612	08 83	WK

Zeichn.-Nr	Datum	Name
1 GMA	27 2 80	Bg
gezeichnet	02 80	
bearbeitet	11 80	
geprüft		
freigegeben		


STOP
X212
W212
CAV DELAY
DAV WIDTH
R200 100k
R202 100k
D206 I
D208 I
D208 II
D207 II
D208 IV
S21II
STOP EXT
VAR LEVEL
R201 2k
X200
D204 SN74S240
D205 SN74S240
X204
X205
D204
D205
C4 100n
C5 100n
+5V
DAV
HIGH-Z
D7
D6
D5
D4
D3
D2
D1
D0
zum Daten-Treiber D
To data driver D
X203.9
X202.9
X201.9
HZ A a19
HZ B a18
HZ C a17
HZ D a16
HZ DAV a25
DAV a27
zum Clock-Treiber
To clock driver
HZ DAV
START EXT.
NDAC
NRFD
D206 VI SN74S04
V5 BAV10
V6 BAV10
H1
W213
X213
END
D207I SN74S32
D207 IV
D207 III
Start ext. a22
DAC a7
RFD a8
R9 330
R10 330
R6 330
C8 100n
R11 330
R12 330
R5 330
D206 II
Clock ext. a15
W214
X214
CLOCK EXT.
R7 10k
C9 100n
HZ ext. a23
R13 2,2k
V1 2N2369
C12 3,9
R1 22k
W211
X211
HIGH-Z
R15 1k
V2 2N2369
R14 2,2k
R2 4,7k
D206
D207
D208
VAR 03 ≙ Blatt 1
VAR 02 ≙ Blatt 2
0 1 2 3
ZENTIMETER
Stromlauf zu
Anschlußfeld
Connector panel
Z
Zeichn. Nr. 344.0473 S
Bl.1 v. 2
344.0015 V
344 0015



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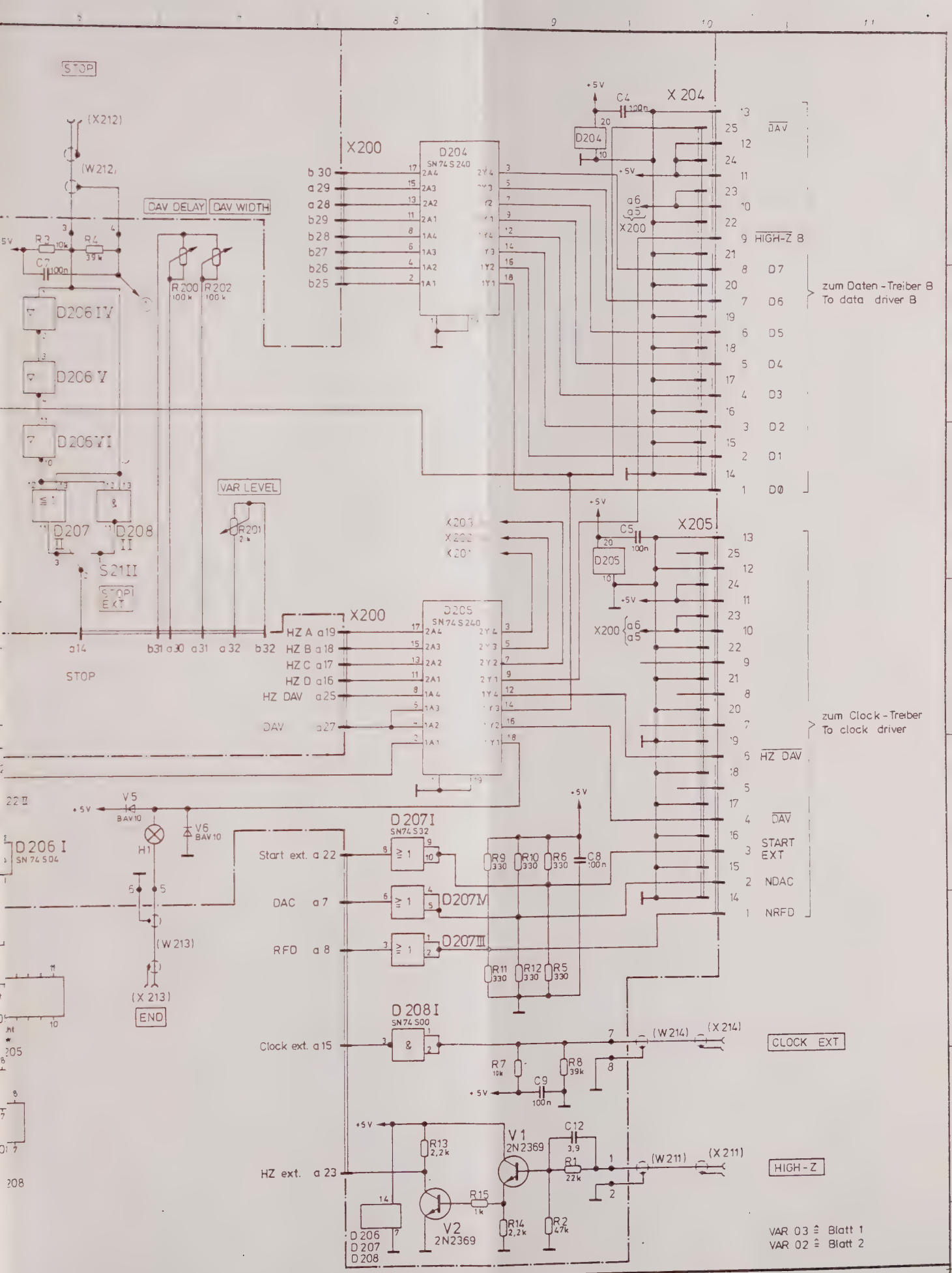
ROHDE & SCHWARZ MÜNCHEN

Änd. zust.	Änd. Mitteilg. Nr.	Datum	Name
A	—	11.80	Ls
B	27966	11.81	Bg

Zeichn.-Nr.	Datum	Name
1 GMA		
gezeichnet	27.2.80	Bg
bearbeitet	02.80	
geprüft	11.80	
normgeprüft		



Stromlauf zu

Anschlußfeld

Connector panel

Zeichn. Nr. 344.0473 S Bl. 2

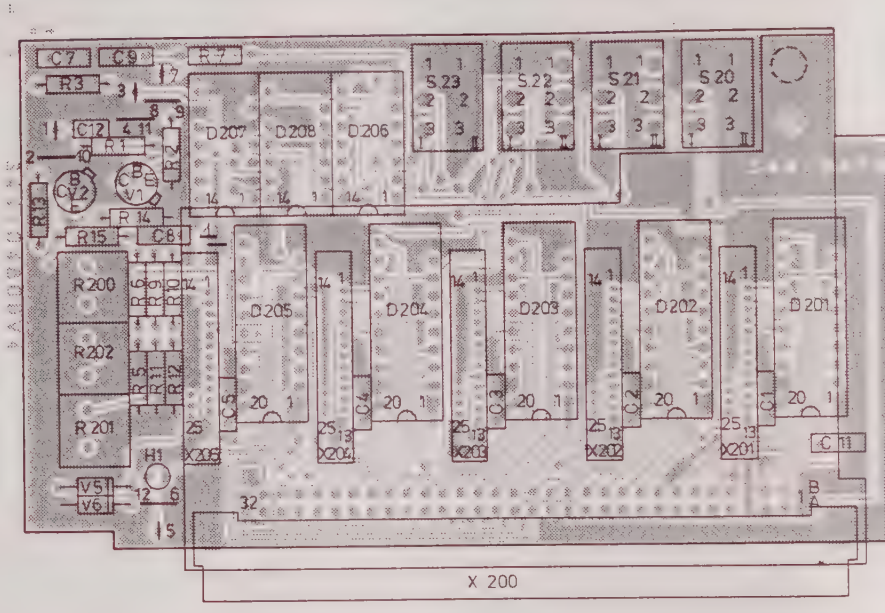
344.0015 V

344 . 0015

0 1 2 3

ZENTIMETER

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



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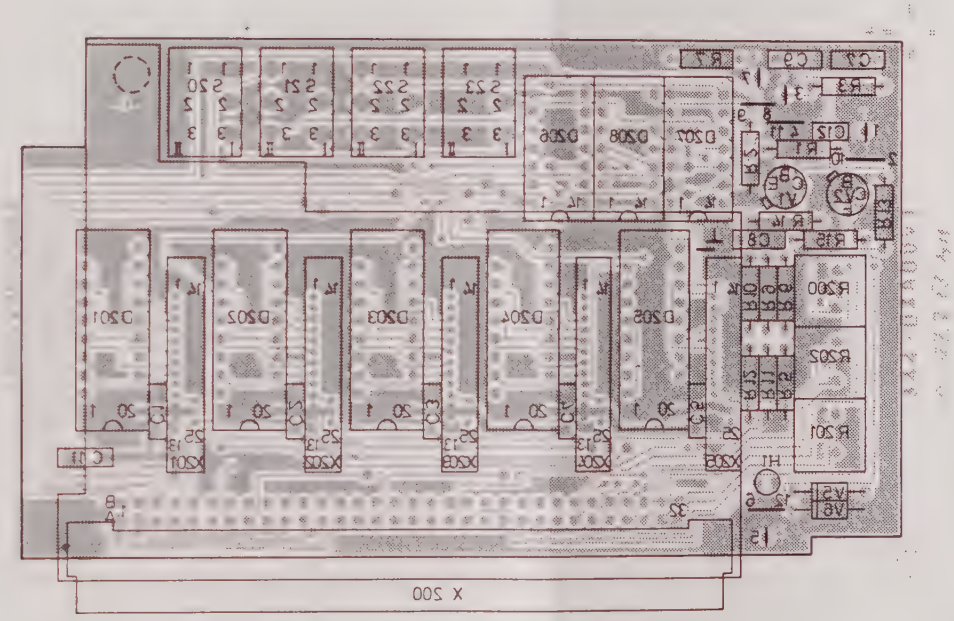
Ansicht und Leitungsführung Lötseite
View of tracks on solder side



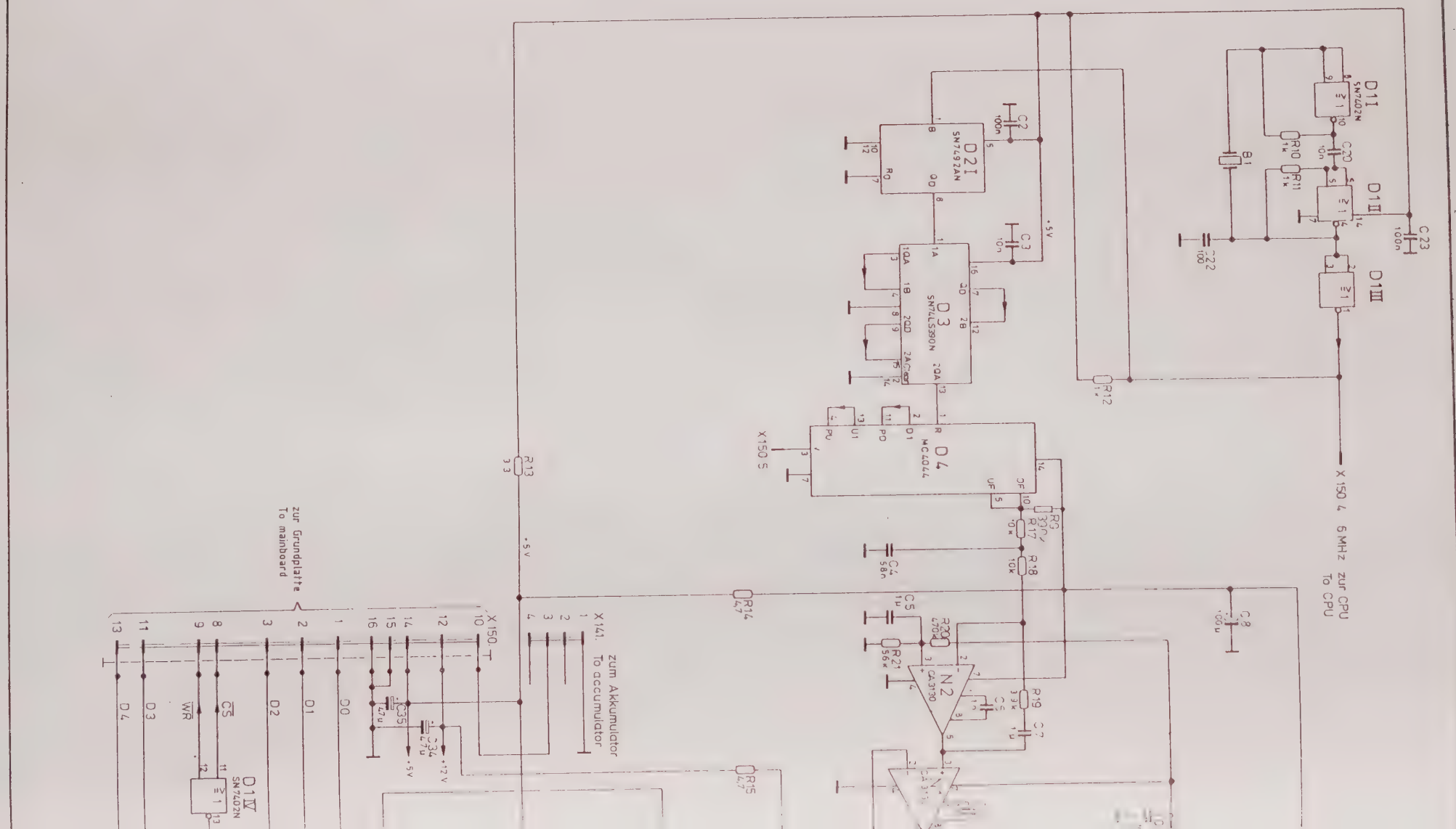
C	30612	8.83	HM	Maße ohne Toleranzangabe		Maßstab 1 : 1	
						Halbzeug, Werkstoff	
				1KSL	Tag	Name	Benennung Anschlußfeld Z
				Bearb	8.83	HM	
				Gepr			
				Norm			
				ROHDE&SCHWARZ		Zeichn.-Nr 344.0473	Blatt-Nr 2
And Zust	Anderungs-Mitteilung	Tag	Name	zu Gerat IGA		reg. i V 344.0015 V	erste Z 344.0209

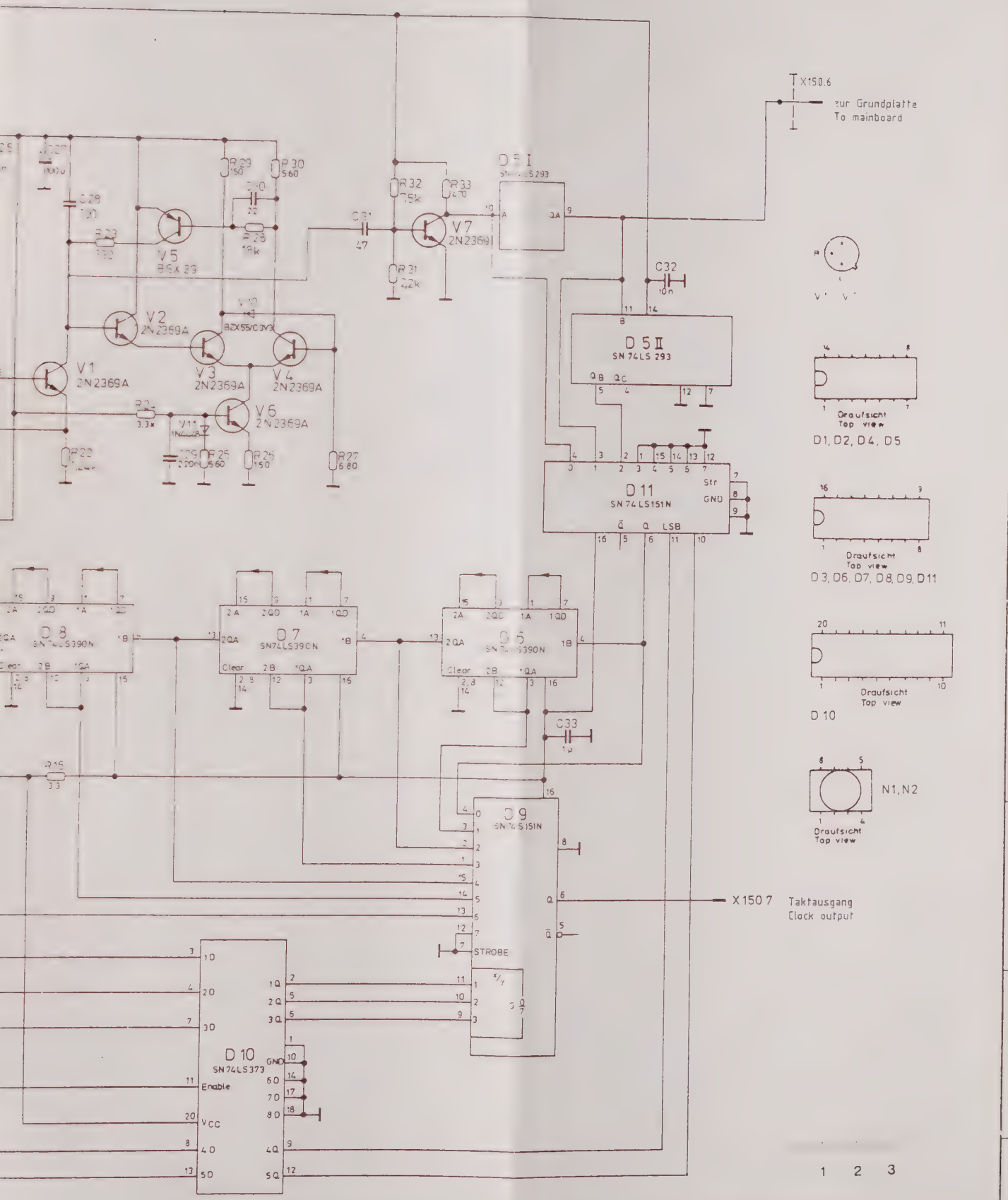
Zeichn.-Nr			Änd. zust.	Änd. Mittlg. Nr.	Datum	Name
1 GMA	Datum	Name	A	———	18 9 80	La
gezeichnet	6 80	Gu	B	———	10 80	Wk
bearbeitet	6 80	La	C	27966	19 11 81	Bg
geprüft	11.80	[illegible]	D	30612	7.83	Wk
normgepr.			E	31571	1.84	Wk

Diese Zeichnung ist unser Eigentum. Vervielfältigung unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ MÜNCHEN

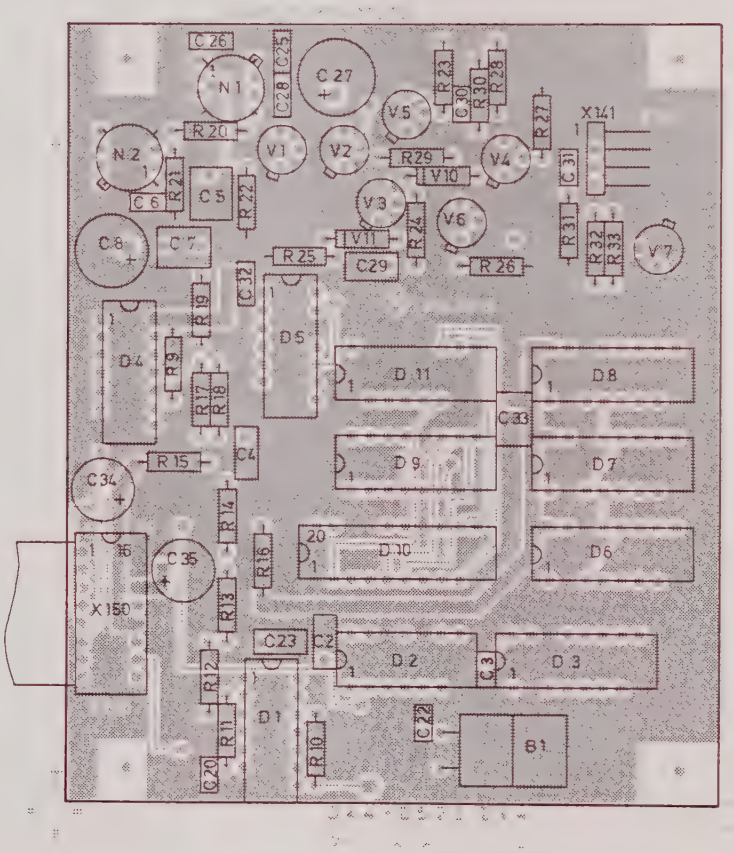
Änd. zust.	Änd. Mittlg. Nr.	Datum	Name	Änd. zust.	Änd. Mittlg. Nr.	Datum	Name





Stromlauf zu	Zeichn. Nr. 344.0515S	
Synthesizer	344.0015V	344.0015

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



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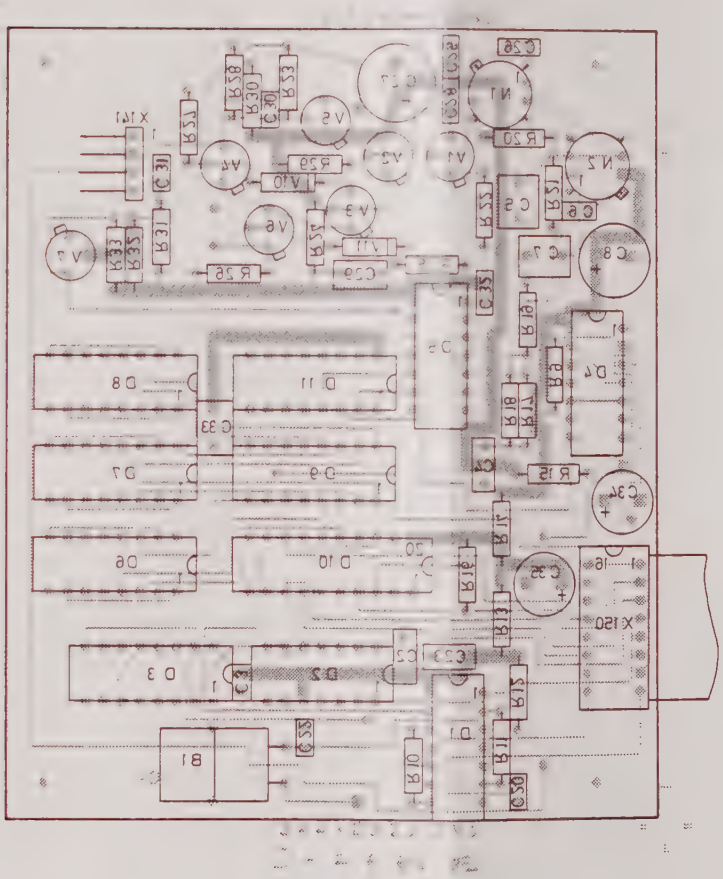
Ansicht und Leitungsführung Lötseite
View of tracks on solder side



D	30612	8.83	WK	Maße ohne Toleranzangabe			Maßstab 1 : 1	
							Halbzeug, Werkstoff	
				1KSL	Tag	Name	Benennung	
				Bearb	8.83	WK	Synthesizer	Z
				Gepr				
				Norm				
				ROHDE&SCHWARZ			Zeichn.-Nr 344.0515	Blatt-Nr 2
Änd Zust	Änderungs-Mitteilung	Tag	Name	zu Gerät: IGA			rec. V 344.0015 V	erste Z 344.0015 B

Synthesizer-Prüfung

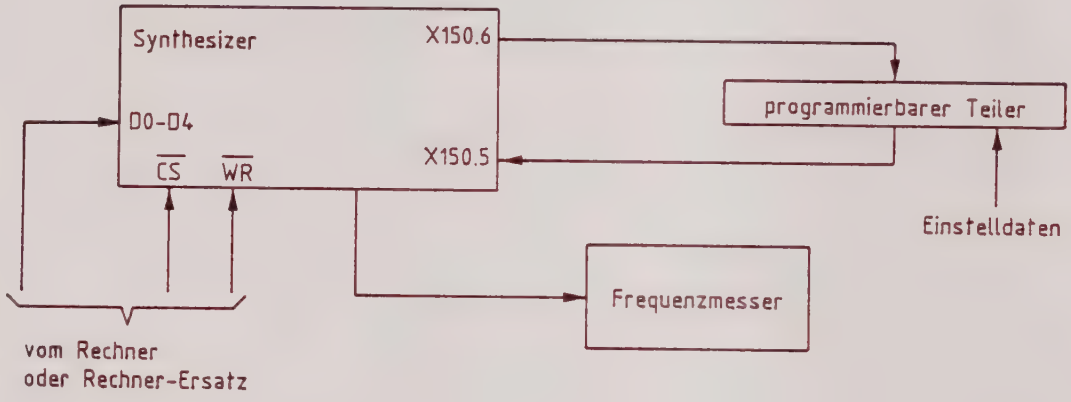
1) Vorprüfung

- Spannungsversorgung anschließen
- an X150.5 High-Pegel anlegen
- Messung:

an X150.4	6 MHz $\pm 5 \cdot 10^{-5}$
an X156.6	2 MHz bis 2,9 MHz

2) Gesamtprüfung

Meßaufbau:



- den programmierbaren Teiler und die Multiplexer des Synthesizers nach folgender Tabelle setzen und mit dem Frequenzmesser kontrollieren, ob die geforderte Frequenz vom Synthesizer geliefert wird.

Stromlauf zu Synthesizer			Zeichn.-Nr. 344.0515	Blatt-Nr. 3	
IGA	reg. i. V. 344.0015 V	erste Z. 344.0015		v.	Bl.

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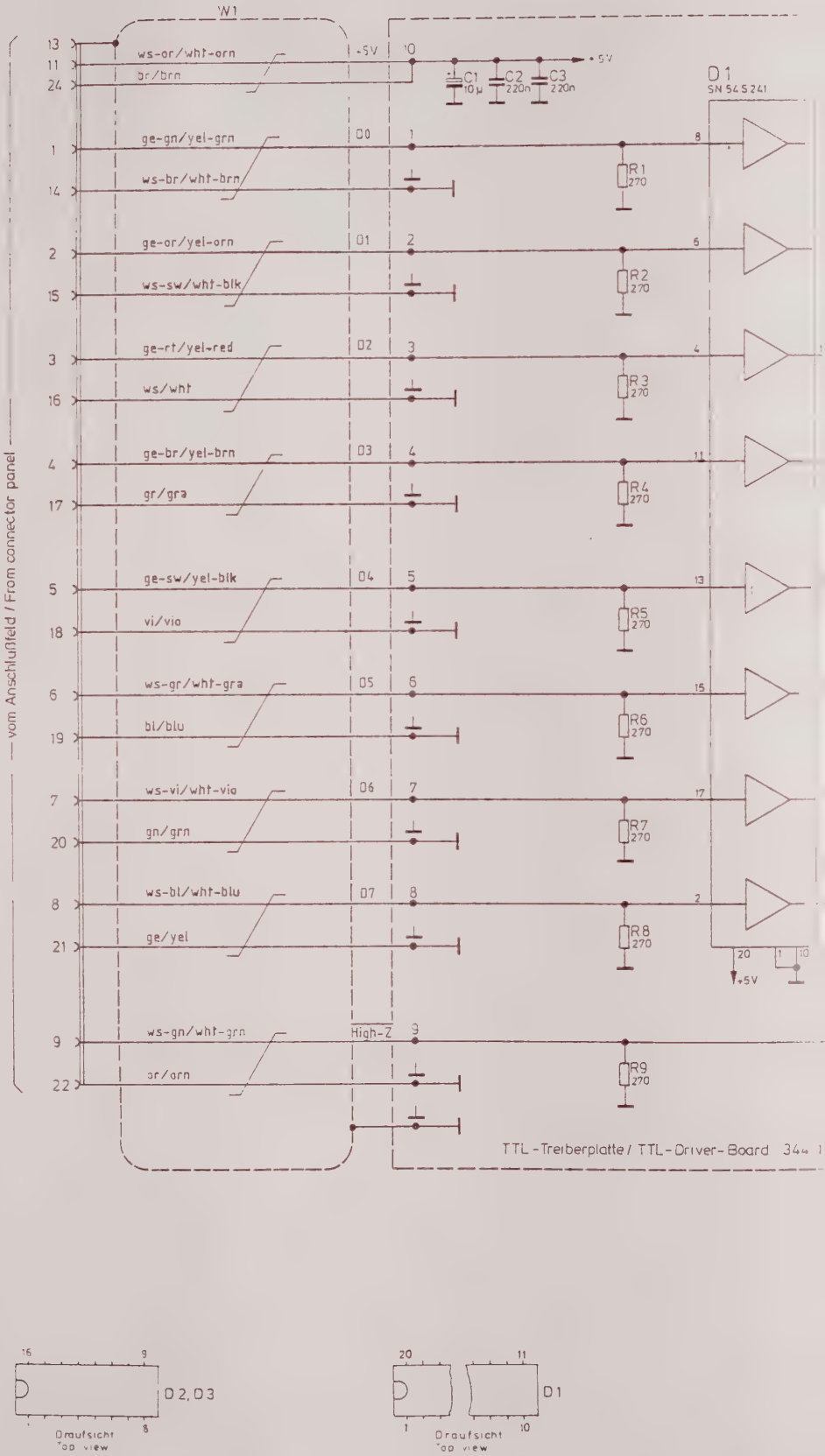
ROHDE & SCHWARZ

IGML | gezeichnet 11.81 Gu | bearbeitet 11.81 Bg | geprüft | normgepr
PF 095 4421 - 10 78



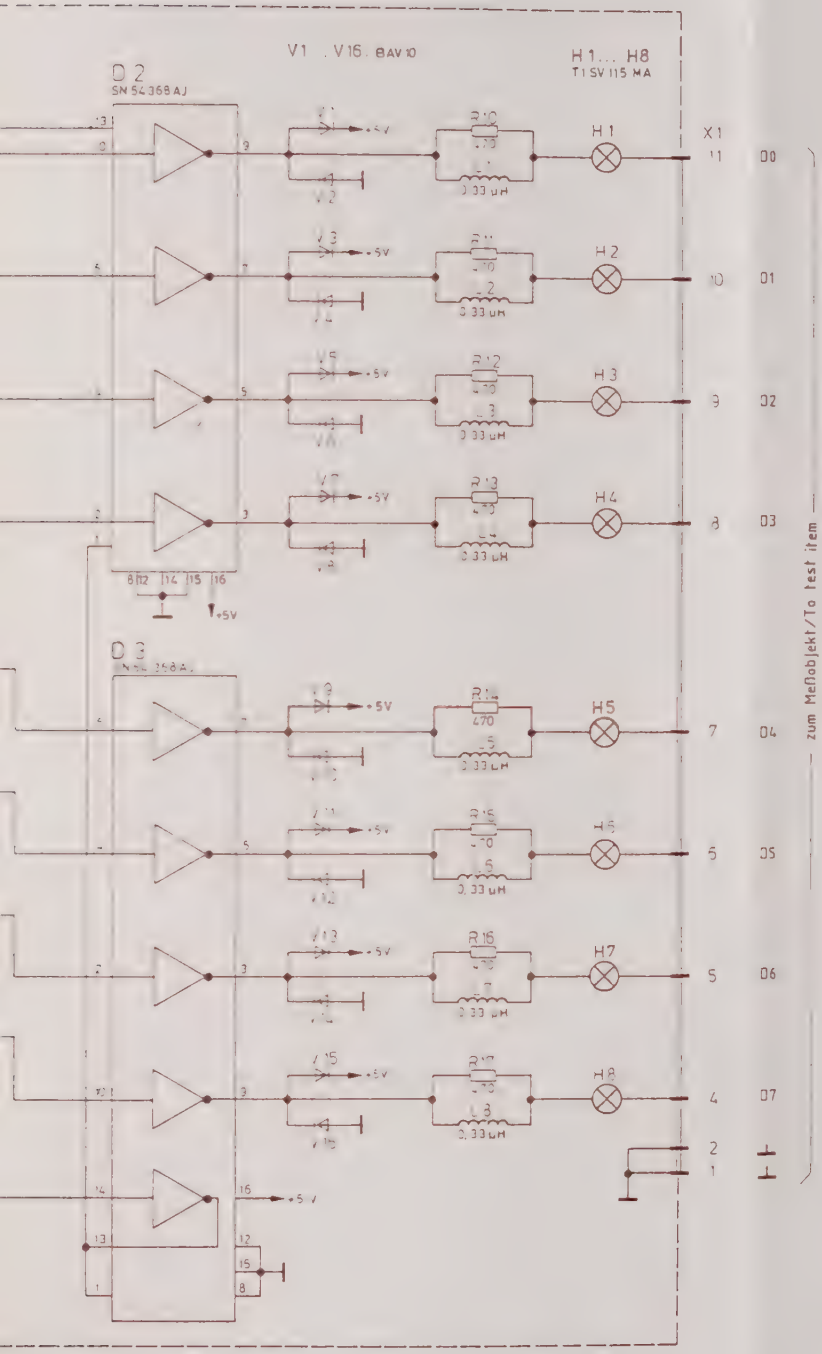
Diese Zeichnung ist unser Eigentum. Vervielfältigung unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ MÜNCHEN

Änd. zust.	Änd. Mittlg. Nr.	Datum	Name
A	27966	27966	Bg

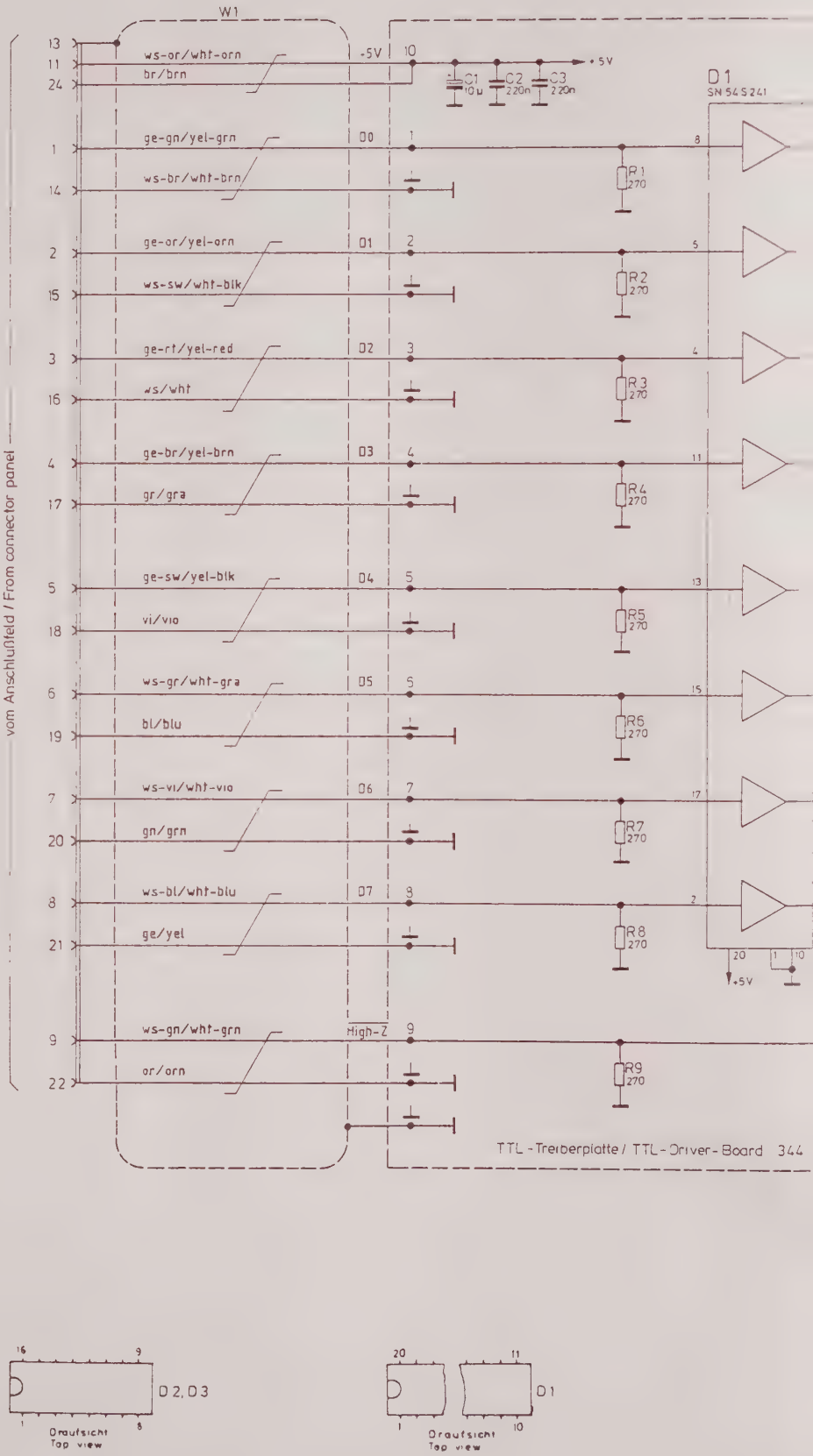
Zeichn.-Nr. 344 0915 S

	Datum	Name
IGMA		
gezeichnet	18 12 80	Gu
bearbeitet	18 12 80	Li
geprüft	2.81	[illegible]
normgepr.		



0 1 2 3
ZENTIMETER

Stromlauf zu	TTL - Datentreiber A TTL - Data - Driver A	Z	Zeichn. Nr. 344.0915 S
			344.0015 V | 344.0021



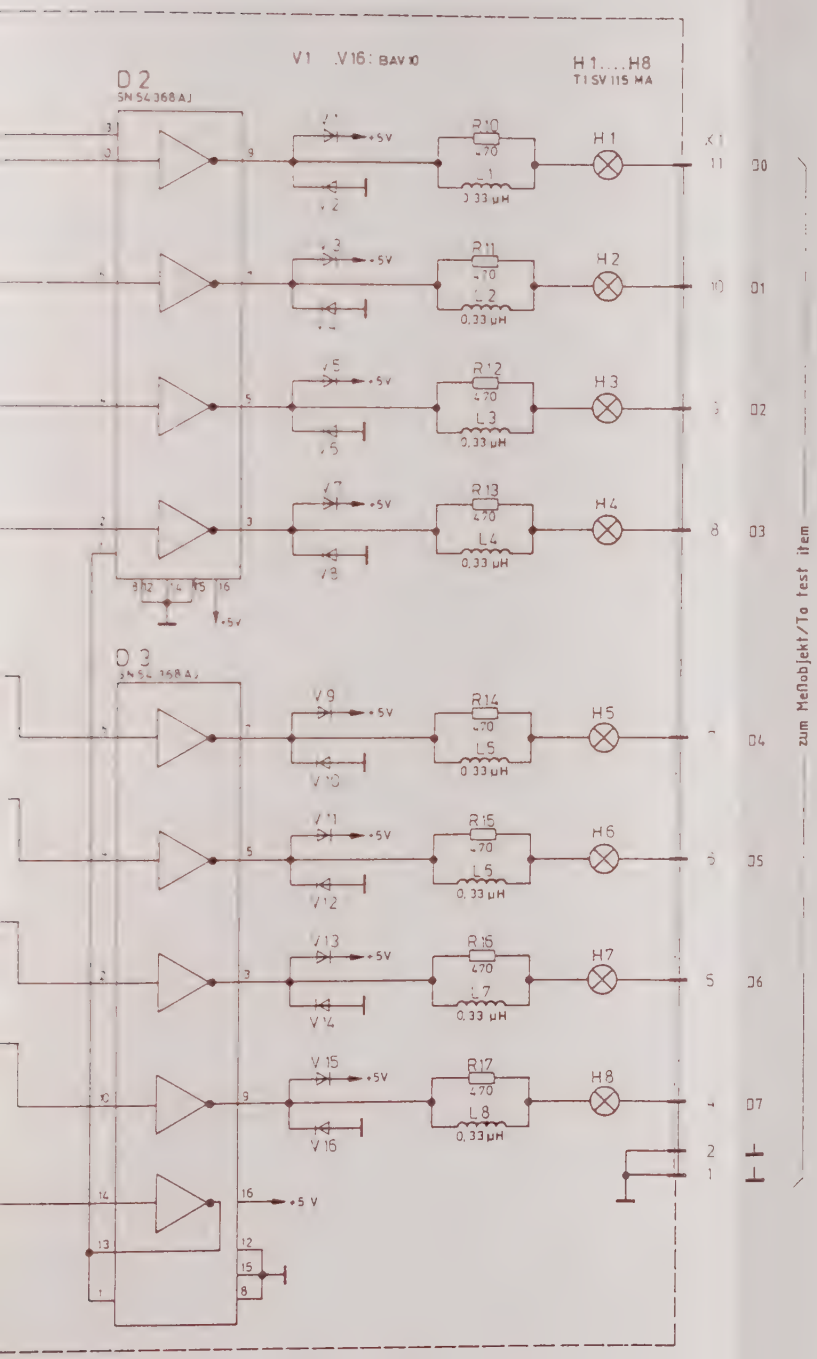
Zeichn.-Nr. 344.0921S

	Datum	Name
IGMA		
gezeichnet	18.12.80	Gu
bearbeitet	18.12.80	Li
geprüft	2.VI	
normgeprüft		

Änd. zust.	Änd. Mittlg. Nr.	Datum	Name
A	27966	17.11.81	Bg

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ MÜNCHEN



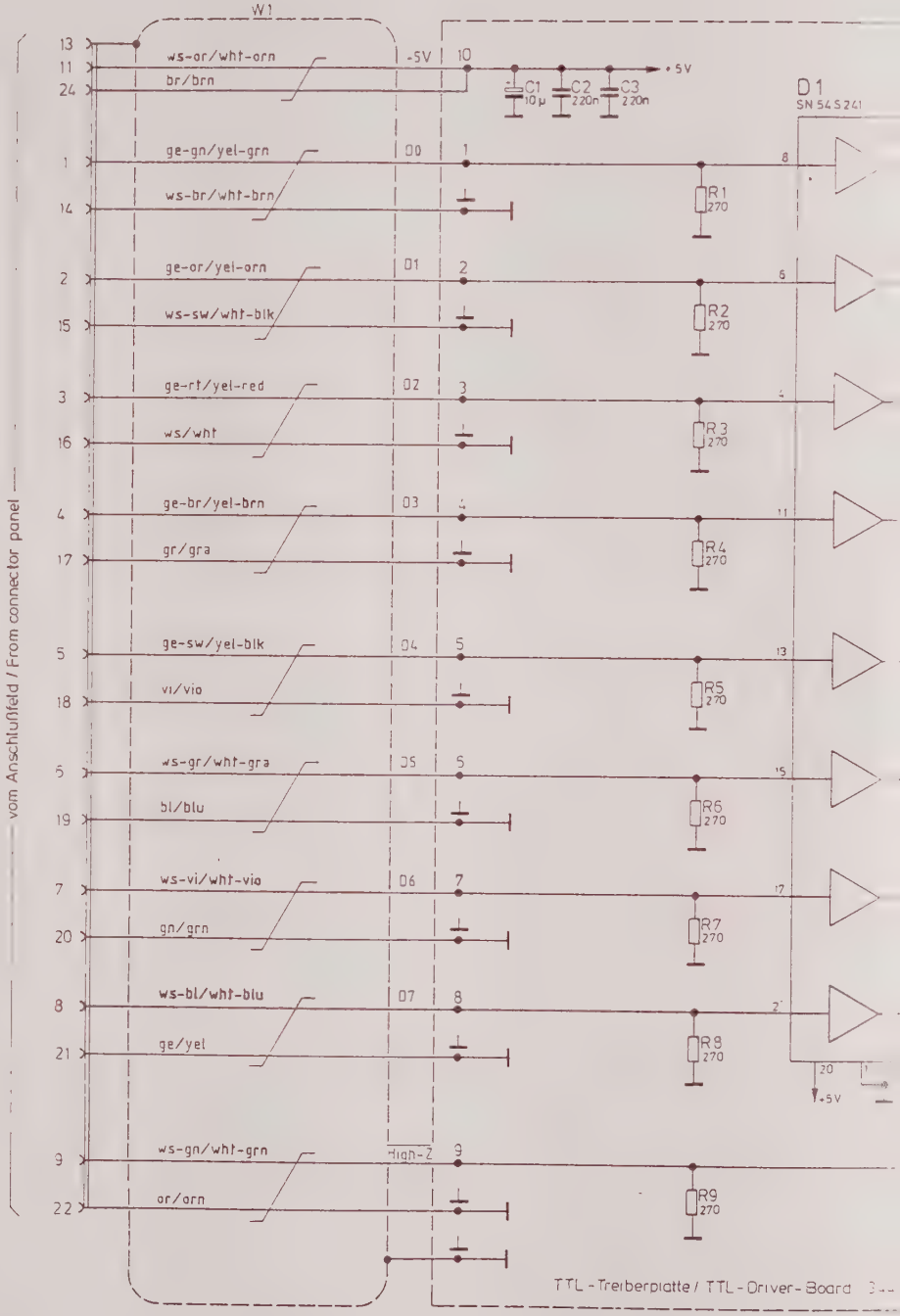
Stromlauf zu

TTL - Datentreiber B
TTL - Data-Driver B

Z

Zeichn. Nr. 344.0921 S

344.0015 V | 344.0021



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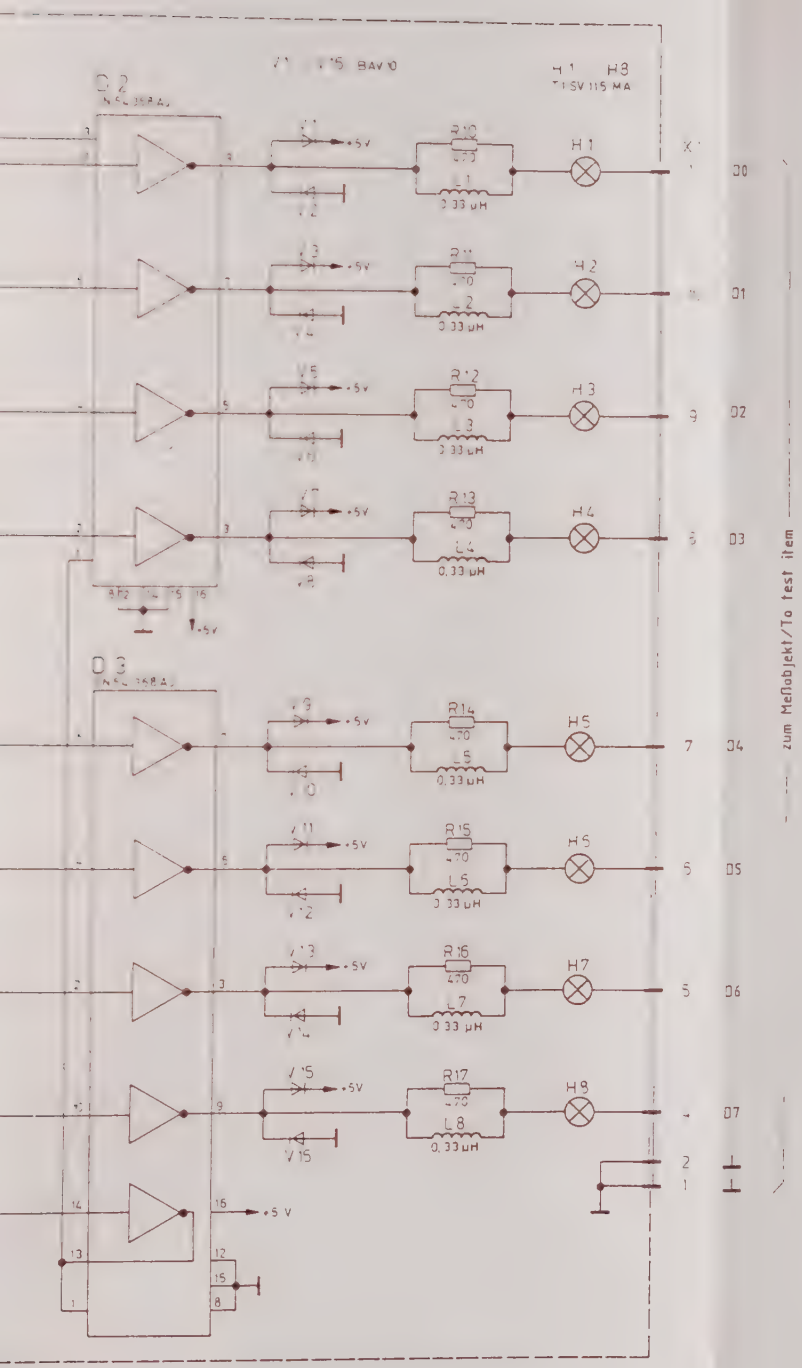
ROHDE & SCHWARZ MÜNCHEN

Änd. Zust.	Änd. Mitteilg. Nr.	Datum	Name
A	27966	17.11.81	Bg

Zeichn.-Nr. 344 0938S

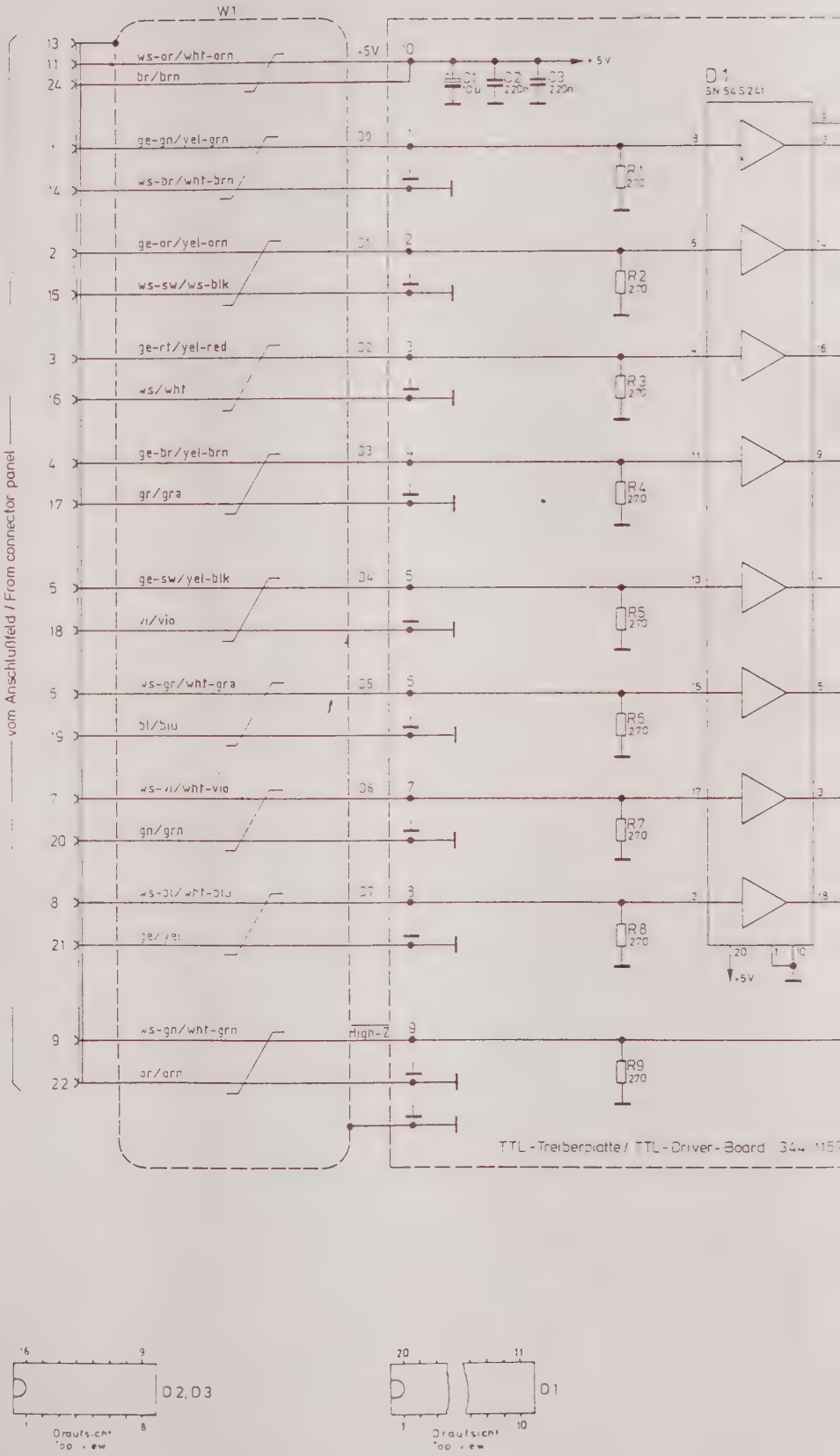
1GMA

	Datum	Name
gezeichnet	18.12.80	Gu
bearbeitet	18.12.80	Li
geprüft	2.81	
freigegeben		



0 1 2 3
ZENTIMETER

Stromlauf zu	TTL - Datentreiber C TTL - Data-Driver C	Z	Zeichn. Nr. 344.0938 S
			344.0015 V / 344.0021

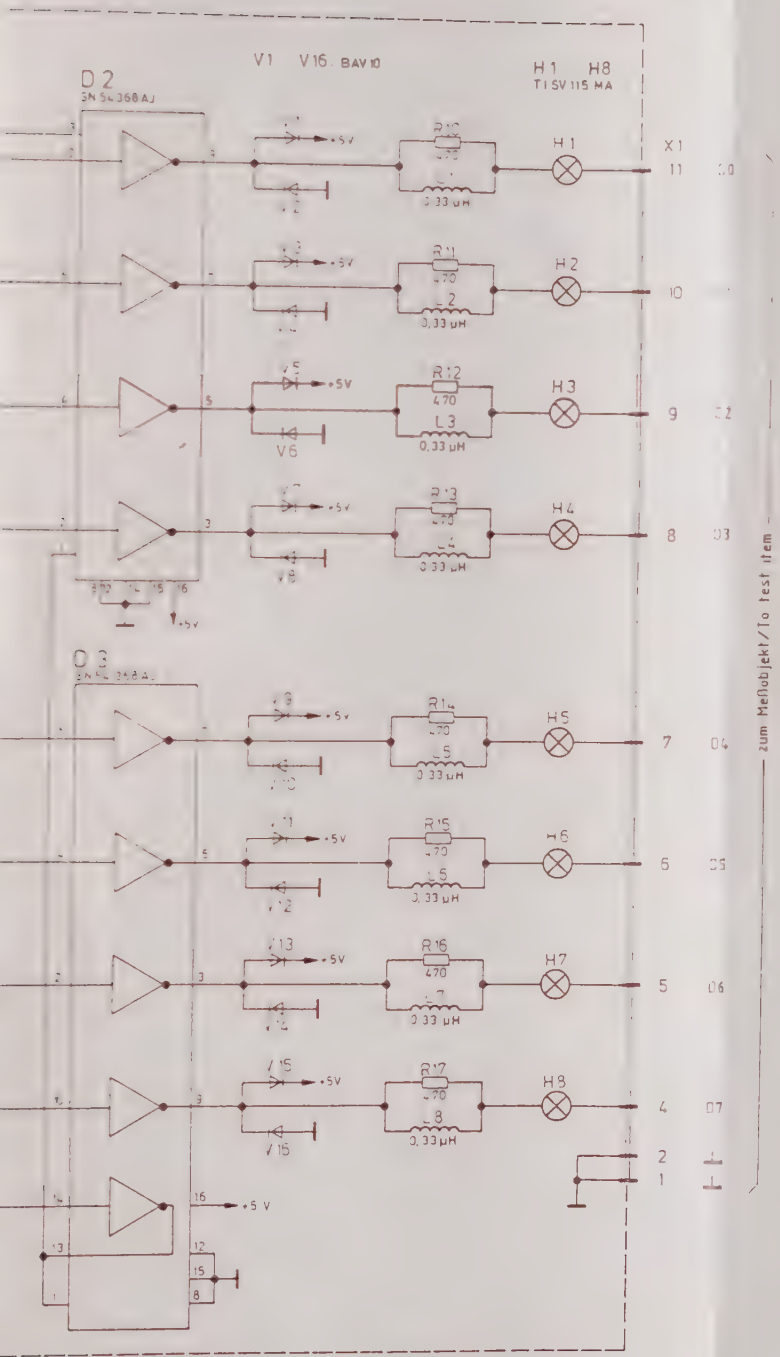


Diese Zeichnung ist unser Eigentum. Vervielfältigung unbefugte Verwertung. Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ MÜNCHEN

Zeichn.-Nr. 344.0944S	Datum	Name
IGMA		
gezeichnet	18.12.80	Gu
bearbeitet	18.12.80	Li
geprüft	2.VI	
normgepr.		

Änd. zust.	Änd. Mittlg. Nr.	Datum	Name
A	27966	17.11.81	Bg



1 2 3

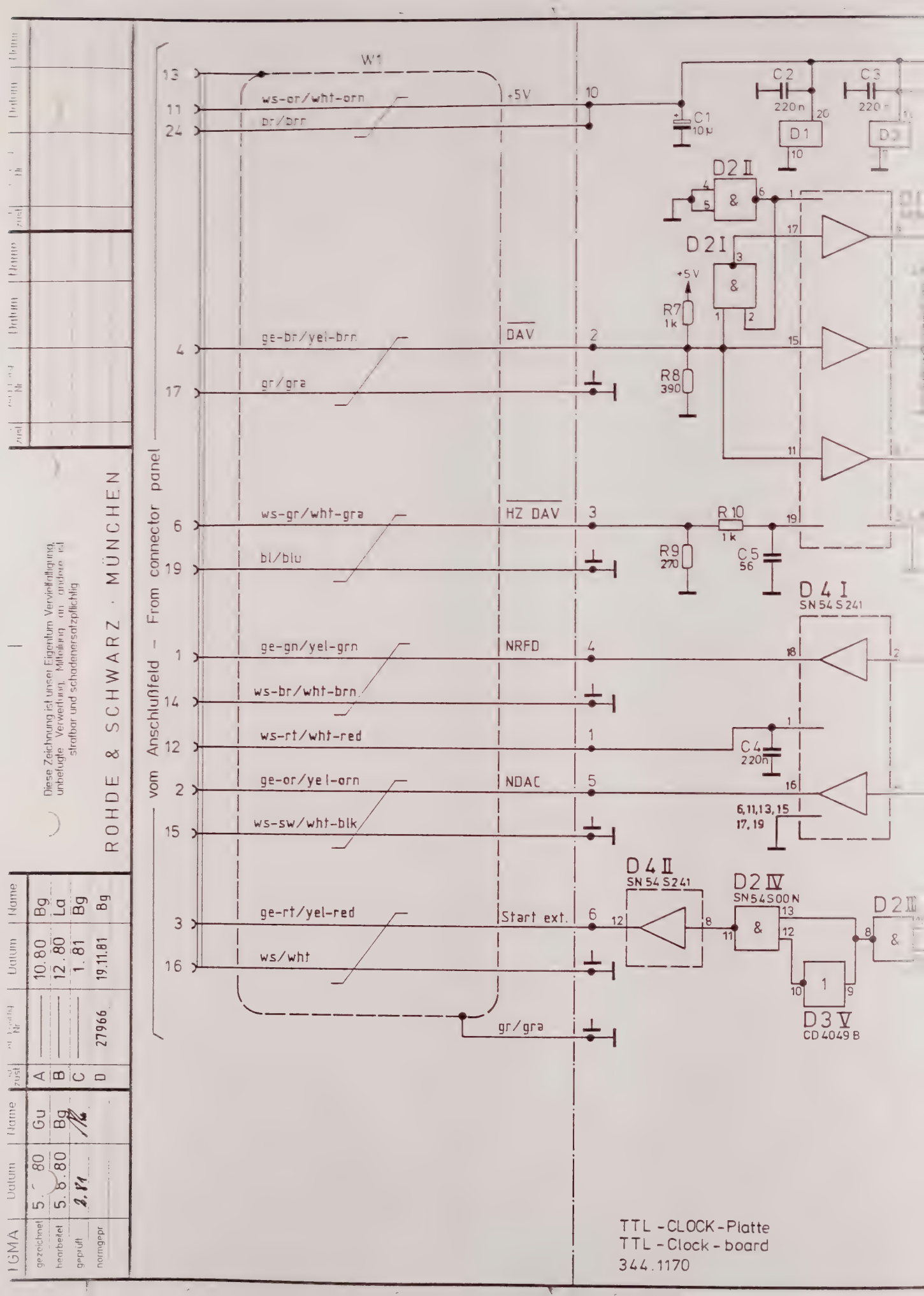
Stromlauf zu

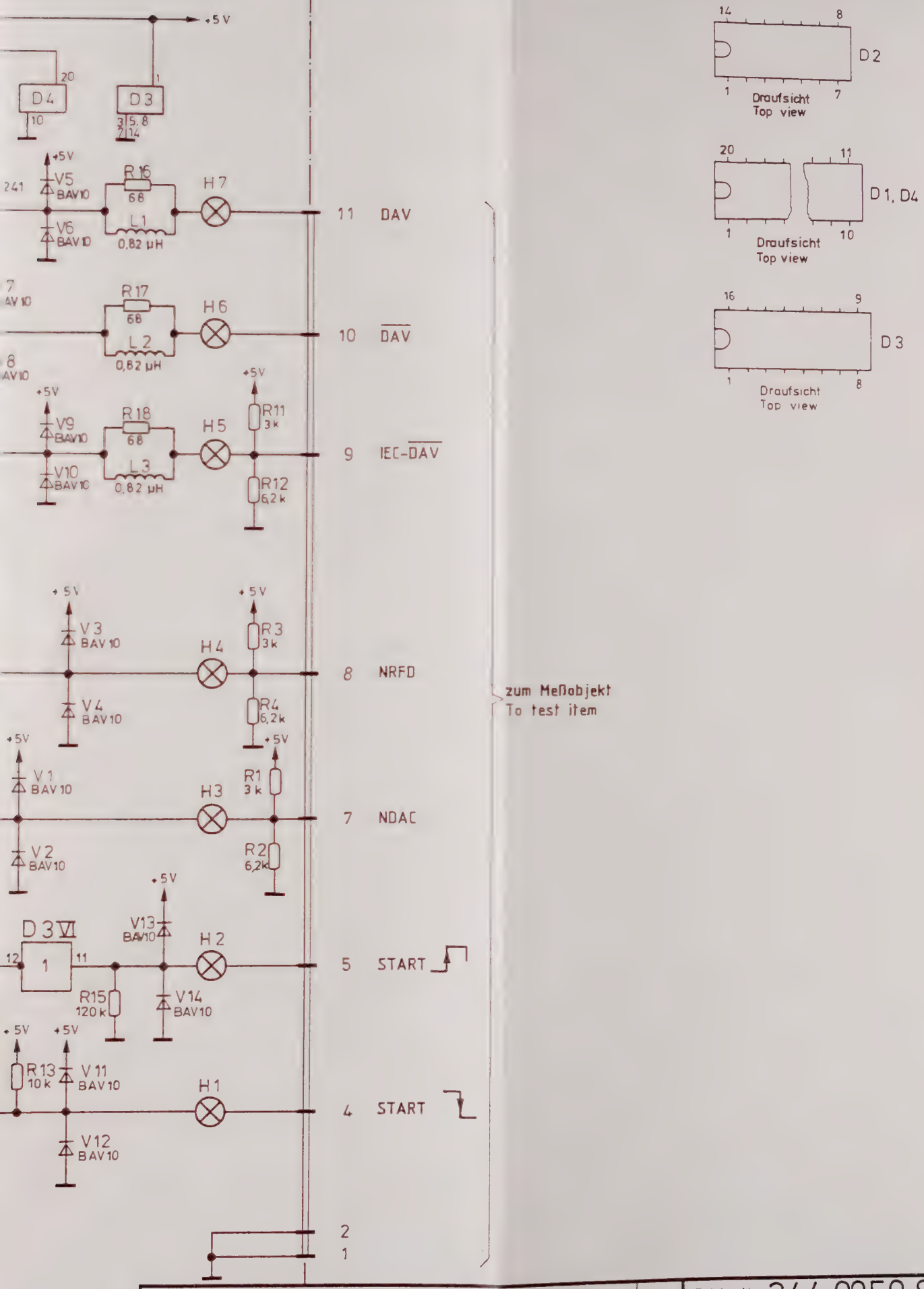
TTL - Datentreiber D
TTL - Data-Driver D

Z

Zeichn. Nr. 344.0944 S

344.0015 V | 344.0021


W1
13
11
24
ws-or/wht-orn
br/brn
+5V
10
C1
10µ
C2
220n
C3
220n
D1
D2 II
D2 I
+5V
R7
1k
R8
390
4
ge-br/yel-brn
DAV
2
17
gr/gra
6
ws-gr/wht-gra
HZ DAV
3
19
bl/blu
R10
1k
R9
270
C5
56
D4 I
SN 54 S 241
1
ge-gn/yel-grn
NRFD
4
14
ws-br/wht-brn
12
ws-rt/wht-red
1
C4
220n
2
ge-or/yel-orn
NDAC
5
15
ws-sw/wht-blk
6,11,13,15
17,19
D4 II
SN 54 S 241
D2 IV
SN 54 S 00 N
D2 III
3
ge-rt/yel-red
Start ext.
6
16
ws/wht
1
D3 V
CD 4049 B
gr/gra
vom Anschlußfeld - From connector panel
ROHDE & SCHWARZ · MÜNCHEN
Diese Zeichnung ist unser Eigentum Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig
TTL - CLOCK - Platte
TTL - Clock - board
344.1170

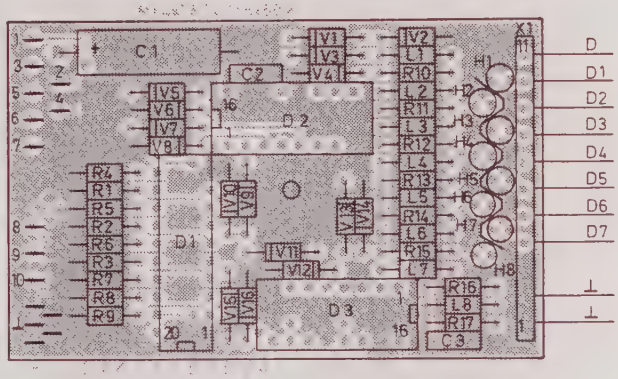


Stromlauf zu

TTL - Clocktreiber
TTL-Clock-Driver

Z	Zeichn. Nr. 344.0950 S	
	reg. i.V. 344.0015 V	erste Z. 344.0021

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



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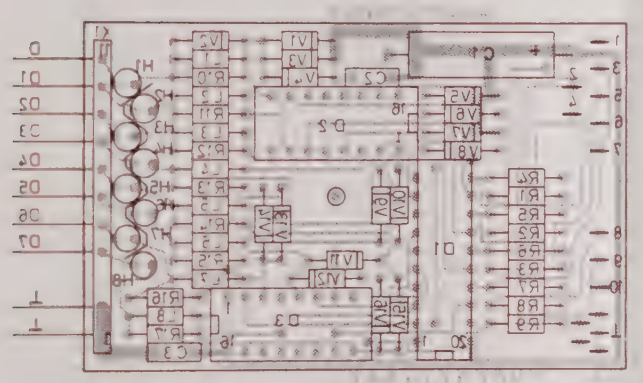
Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Versorg.-Nr		VG-Sachnr
	Maße ohne Toleranzangabe	Maßstab 1 : 1
		Halbzeug, Werkstoff
	1GMA / Tag / Name	Benennung
	Bearb 19.1.81 LI	TTL Treiberplatte TTL-Driver-board — Z
	Gepr 2.81	
	Norm	
	ROHDE & SCHWARZ MÜNCHEN	Zeichn.-Nr 344.1157 — Blatt Nr 2
	zu Gerät IGA-Z1	reg 344.0015 V — Erste Z 344.0915

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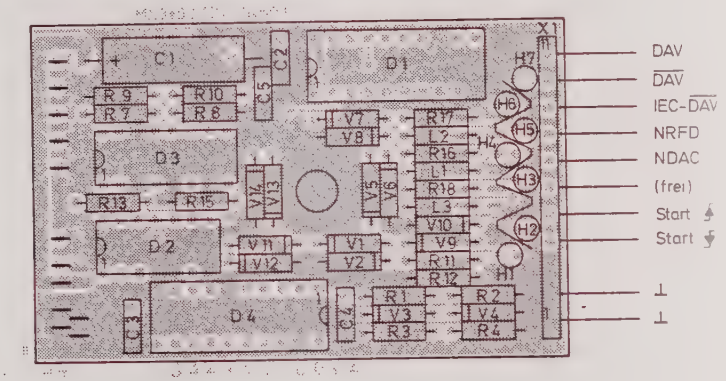
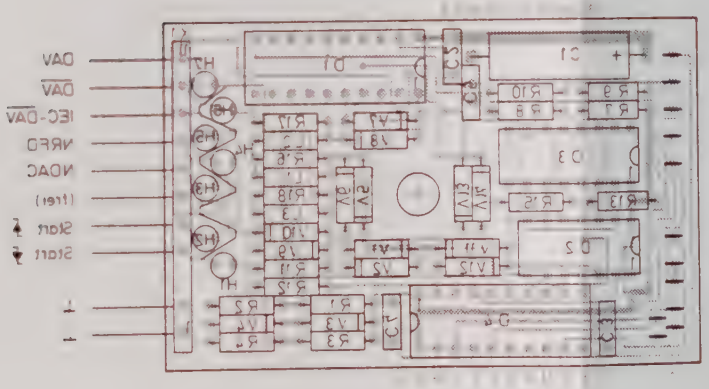
Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Versorg.-Nr						VG-Sachnr	
B	———	23.1.81	LA	Maße ohne Toleranzangabe		Maßstab 1 : 1	
						Halbzeug, Werkstoff	
				1GMC	Tag	Name	Benennung: TTL-Clock-Platte / TTL-Clock-board — Z
				Bearb	23.1.81	LA	
				Gepr	2.81		
				Norm			
				ROHDE & SCHWARZ MÜNCHEN			Zeichn.-Nr 344.1170 — Blatt-Nr 2
Anc	Anderungs-	Tag	Name	zu Gerät IGA			rec \ 344.0015V — Ersatz = 344.0950

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer	Blatt Nr.
	01	0780	IGA-B1 IEC-BUS	Z	344.2818.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
D80	BJ P8291 IECBUS-INTERFACE INTEL P8291	BJ 300.6253	344.2818.01
D81	BJ MC3448AP 4XBUS-TRANSC. MOTOROLA MC3448AP	BJ 300.6247	344.2818.01
D82	BJ MC3448AP 4XBUS-TRANSC. MOTOROLA MC3448AP	BJ 300.6247	344.2818.01
D83	BJ MC3448AP 4XBUS-TRANSC. MOTOROLA MC3448AP	BJ 300.6247	344.2818.01
D84	BJ MC3448AP 4XBUS-TRANSC. MOTOROLA MC3448AP	BJ 300.6247	344.2818.01
X13	FP IC-STECKERLEISTE 16POL CANNON RTG08A16LA-001/702	099.1633	344.2818.01
X14	FP IC-STECKERLEISTE 16POL CANNON RTG08A16LA-001/702	099.1633	344.2818.01
			- ENDE -

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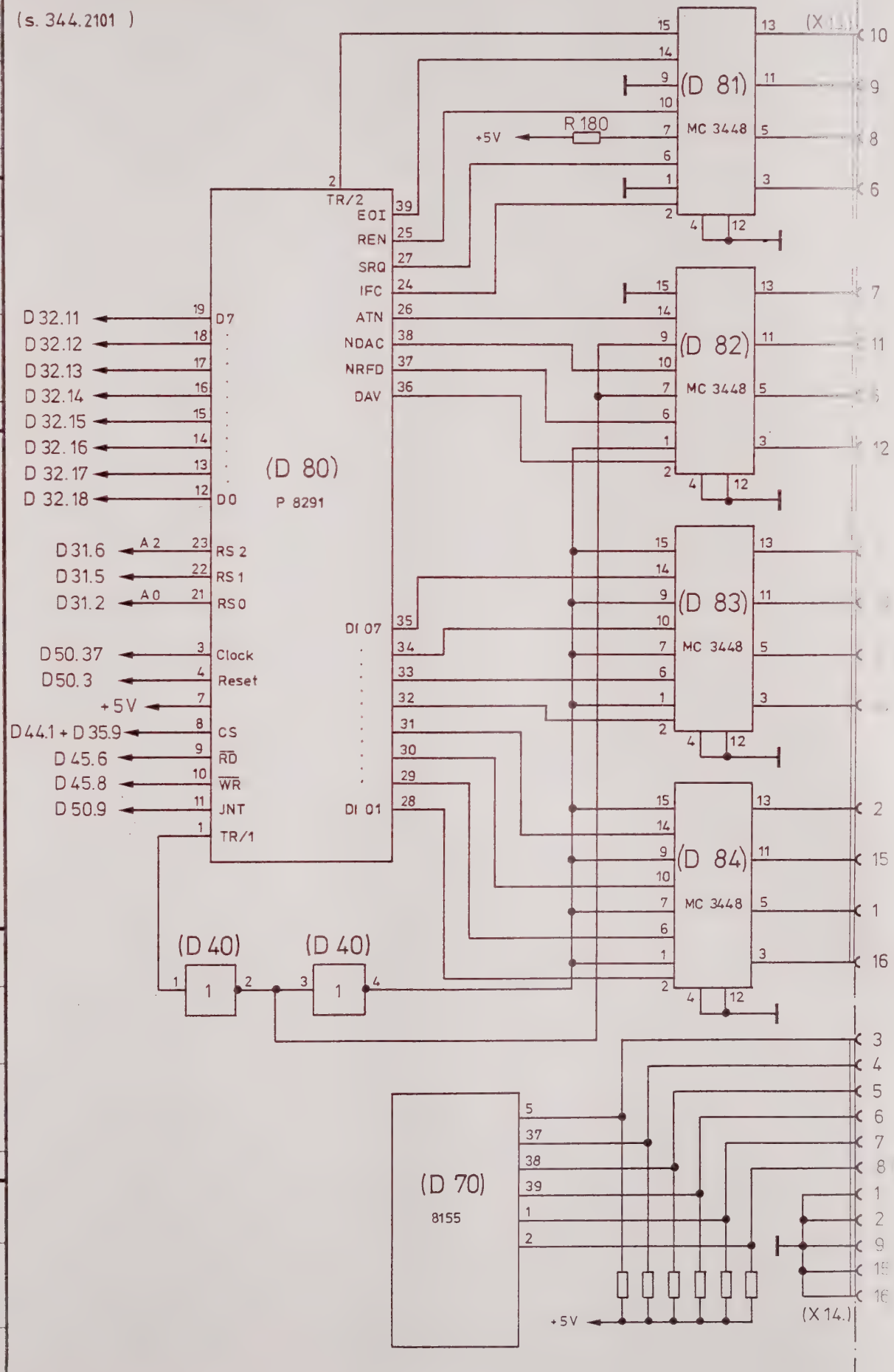
Die Bauteile D 80 bis D 84 sind in der Grundplatte 344.2101 eingesetzt.
D 80 ... D 84 are inserted in board 344.2101

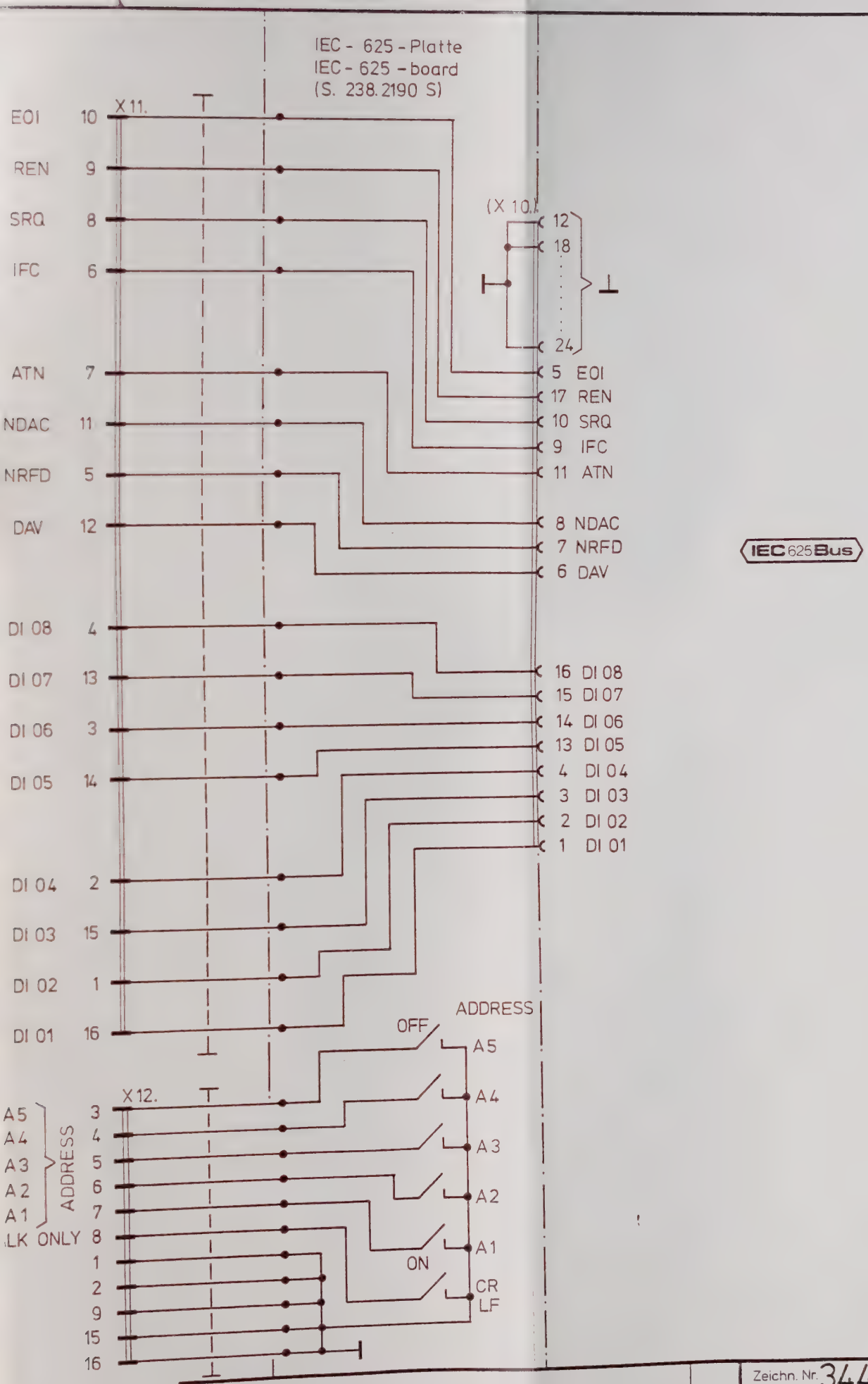
(s. 344.2101)



Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ · MÜNCHEN

	Datum	Name	And-zust	And Mittg Nr	Datum	Name
gezeichnet	1[illegible].80	An	A	30734	07.85	WK
bearbeitet	11.80	Bg				
geprüft	11.80	[illegible]				
normgepr						


IEC - 625 - Platte
IEC - 625 - board
(S. 238.2190 S)
X 11.
EOI 10
REN 9
SRQ 8
IFC 6
ATN 7
NDAC 11
NRFD 5
DAV 12
DI 08 4
DI 07 13
DI 06 3
DI 05 14
DI 04 2
DI 03 15
DI 02 1
DI 01 16
(X 10.)
12
18
24
5 EOI
17 REN
10 SRQ
9 IFC
11 ATN
8 NDAC
7 NRFD
6 DAV
16 DI 08
15 DI 07
14 DI 06
13 DI 05
4 DI 04
3 DI 03
2 DI 02
1 DI 01
IEC 625 Bus
ADDRESS
OFF
A5
A4
A3
A2
A1
ON
CR
LF
X 12.
A5
A4
A3
A2
A1
ADDRESS
LK ONLY
3
4
5
6
7
8
1
2
9
15
16
Stromlauf zu
IGA - B1 IEC - BUS
Z
Zeichn. Nr. 344.2818.02 S
reg. i.V 344.2818 V
erste Z

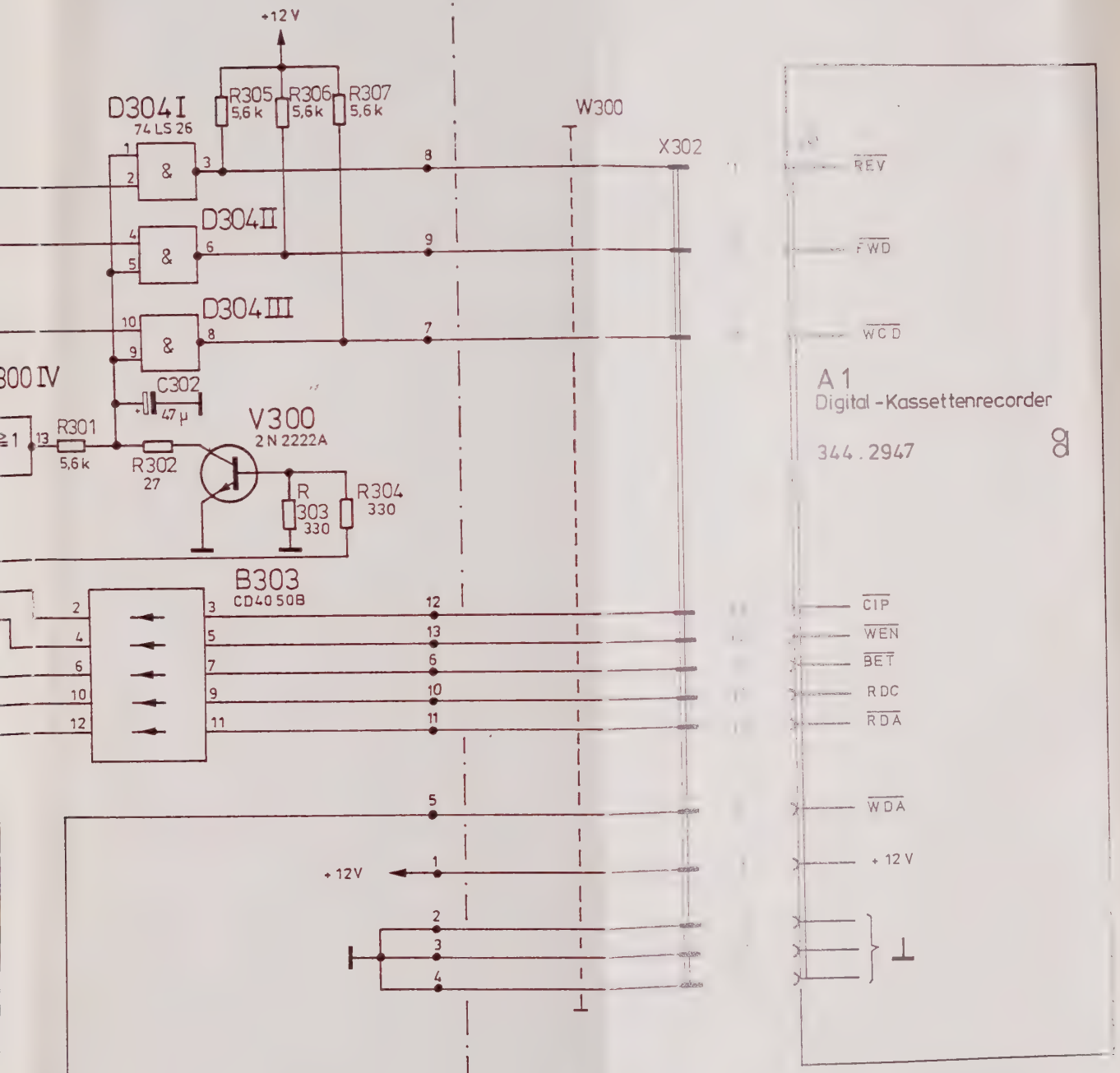
ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	07	1080	IGA-B2 BANDSPEICHER Z	344.2918.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A1	GM DIGITAL-KASSETTENREC. PHILIPS 8920 405 10601	344.2947	344.2918.01
C300	CE 4,7UF-10+100%63V 9X13 ROEDERST ELKOEK4/63	CE 022.7643	344.2924
C301	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.2924
C302	CE 47 UF+-20% 6V 7X 5X11 ERO-TANTAL TA/ELKOETR247/6	CE 022.8040	344.2924
C303	CC 10NF-20+50%7X8R6000 THOMSON COX767/10000/PF-20+5	CC 087.7525	344.2924
C304	CE 4,7UF-10+100%63V 9X13 ROEDERST ELKOEK4/63	CE 022.7643	344.2924
D300	BL SN74LS02N 4/2INP.NOR TEXAS IC-SN74LS02N	BL 266.4658	344.2924
D301	BL SN74160N DEZ.ZAEHLER TEXAS IC-SN74160N	BL 273.0360	344.2924
D302	BL SN74LS241N 8XBUS-TREIB TEXAS SN74LS241N	BL 302.7163	344.2924
D303	BL CD4050BE 6/CONVERTER RCA CD4050BE	BL 086.7250	344.2924
D304	BL SN74LS26N 4/2INP.NAND TEXAS SN74LS26N	BL 280.7567	344.2924
R300	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	344.2924
R301	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.2924
R302	RF 0,25W 27 OHM +-5% DRALORIC LCA0207/+-5%27	RF 069.2702	344.2924
R303	RF 0,25W330 OHM +-5% DRALORIC LCA0207/+-5%330	RF 069.3315	344.2924
R304	RF 0,25W330 OHM +-5% DRALORIC LCA0207/+-5%330	RF 069.3315	344.2924
R305	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.2924
R306	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.2924
R307	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.2924
R308	RF 0,25W5,6KOHM +-5% DRALORIC LCA0207/+-5%5,6K	RF 069.5624	344.2924
V300	AK 2N2222A 40V0,8A300MHZ VALVO TRANSISTOR2N2222A	AK 010.5405	344.2924
W300	VERBINDUNGSKABEL Z	344.2976	344.2924
X310	FP BUCHSENLEISTE 15POL BERG 65001-015	FP 293.6341	344.2924

- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Band - Interface
344.2924



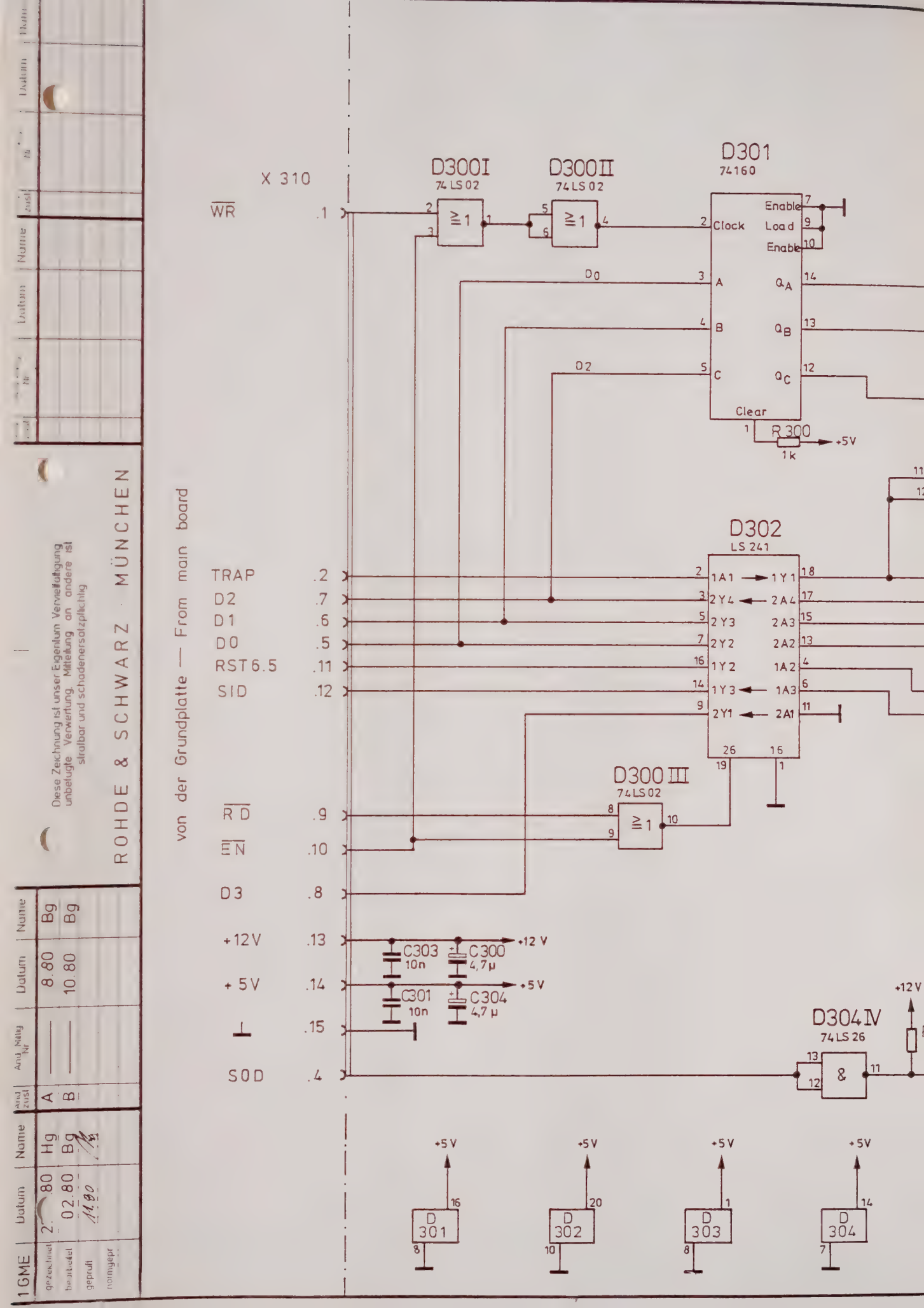
Stromlauf zu IGA-B2 Bandspeicher
Tape storage unit

Z

Zeichn. Nr. 344.2918.02 S

reg i.V 344.2918V

erste Z



ROHDE & SCHWARZ · MÜNCHEN

Diese Zeichnung ist unser Eigentum Vervielfältigung unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

	Datum	Name
gezeichnet	2.80	Hg
bearbeitet	02.80	Bg
geprüft	11.80	
normgeprt		

Änd. Zust.	Änd. Mitteilg. Nr.	Datum	Name
A		8.80	Bg
B		10.80	Bg

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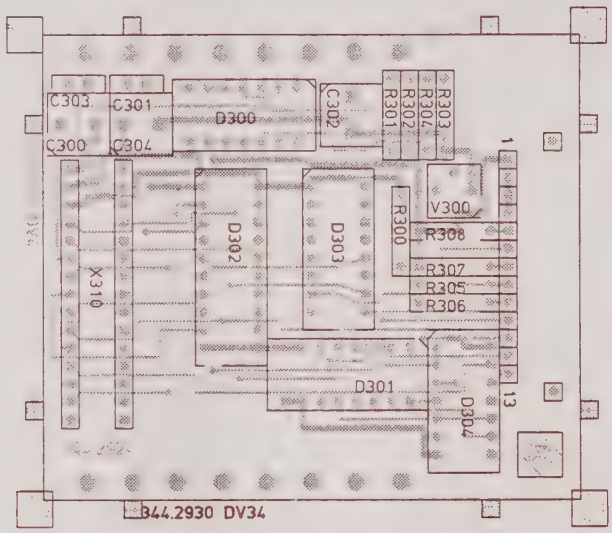
Ansicht und Leitungsführung Bauteilseite
View of tracks on component side

von der Grundplatte →



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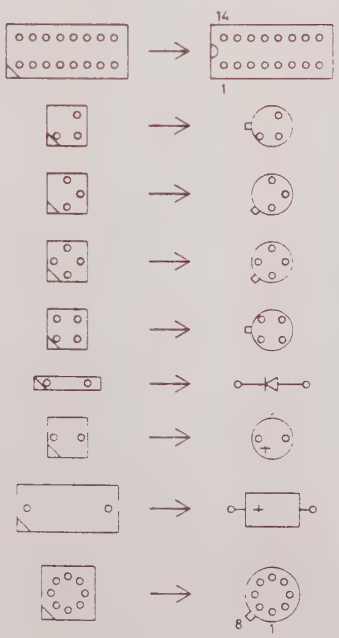
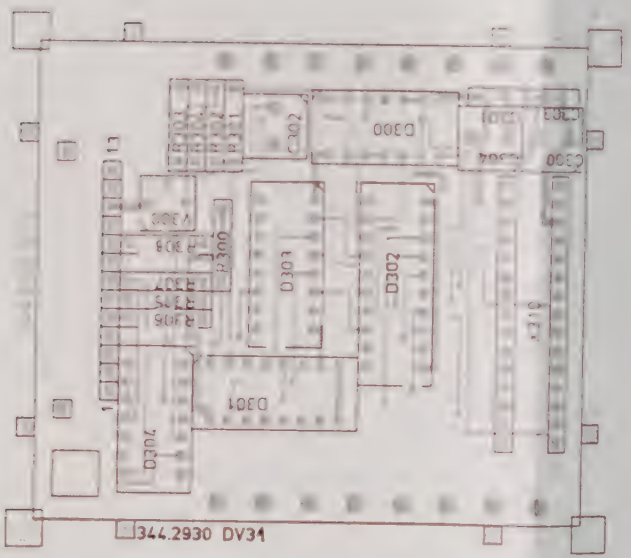
Symbolschlussel



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



A

Versorg.-Nr		VG-Sachnr	
	Maße ohne Toleranzangabe	Maßstab 1 : 1	
		Halbzeug, Werkstoff	
	1GM / Tag / Name	Benennung	
	Bearb 9.80 Bg	Band - Interface	Z
	Gepr 11.80		
	Norm		
	ROHDE & SCHWARZ MÜNCHEN	Zeichn.-Nr 344.2924	Blatt-Nr 2
And Zust / Änderungs-Mitteilung / Tag / Name	zu Gerät IGA - 82	reg \ 344.2918 V erste Z 344.2918	V B

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	C1	1181	IGA-Z1 UNIV.DATA DRIVER	344.3414.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C1	CC 330NF+-10% 50V8K1200VI AEROVOX CKR06BX334KL	CC 082.7740	344.3450
C2	CC 330NF+-10% 50V8K1200VI AEROVOX CKR06BX334KL	CC 082.7740	344.3450
D1	BJ SN75361AP 2XTTL/MOS-TR NSC DS75361N	BJ 294.8490	344.3450
BIS D8	BJ SN75361AP 2XTTL/MOS-TR NSC DS75361N	BJ 294.8490	344.3450
D9	BJ SN75451BP 2XAND-LT.TRB TEXAS SN75451P	BJ 224.3924	344.3450
H1	EF T1 BI-PIN 16V30MILLIA MENZEL&SAS MGG1630-8	344.3572	344.3450
BIS H8	EF T1 BI-PIN 16V30MILLIA MENZEL&SAS MGG1630-8	344.3572	344.3450
L1	LD 12,0UH 10% 126 MIA DELEVAN	LD 092.3282	344.3450
BIS L8	LD 12,0UH 10% 126 MIA DELEVAN	LD 092.3282	344.3450
R2	RN 9X270 OHM+-2% SIL10 H5 BOURNS 4310R-101-271	RN 344.3972	344.3450
R3	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.3450
R4	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	344.3450
R5	RF 0,25W2,2KOHM +-5% DRALORIC LCA0207/+-5%2,2K	RF 069.2225	344.345_
BIS R8	RF 0,25W2,2KOHM +-5% DRALORIC LCA0207/+-5%2,2K	RF 069.2225	344.3450
R9	RN 4X390 OHM+-2% SIL 8 H5 BOURNS 4308R-102-391	344.3472	344.3450
R10	RN 4X390 OHM+-2% SIL 8 H5 BOURNS 4308R-102-391	344.3472	344.3450
V1	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
BIS V8	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
V9	AE 5082-2800 SCHOTTKY-DI. HEWLETT-P. 5082-2800	AE 012.9066	344.3450
V10	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
BIS V13	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
V14	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
BIS			

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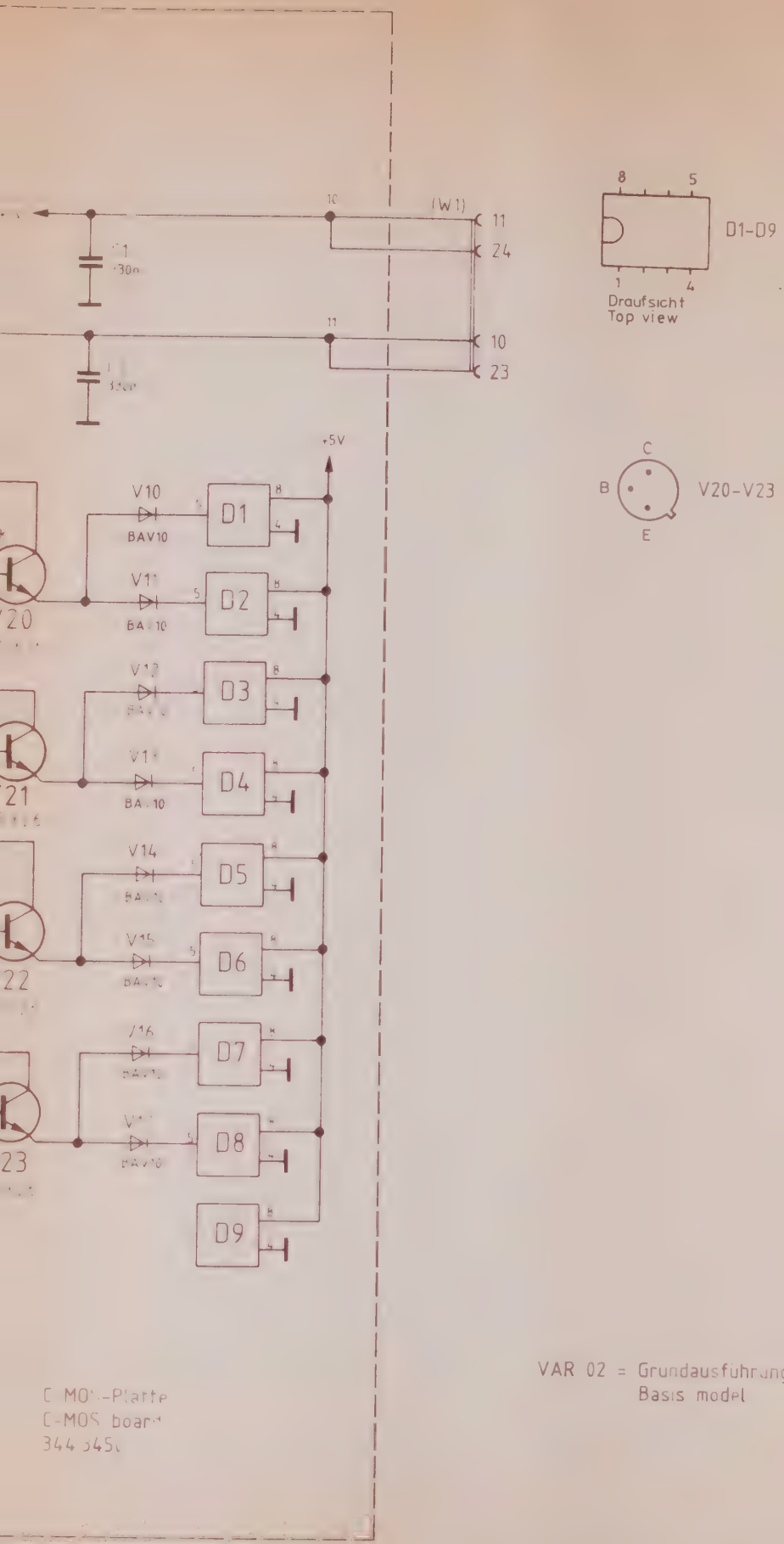
ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	01	1181	IGA-Z1 UNIV.DATA DRIVER	344.3414.01 SA	2

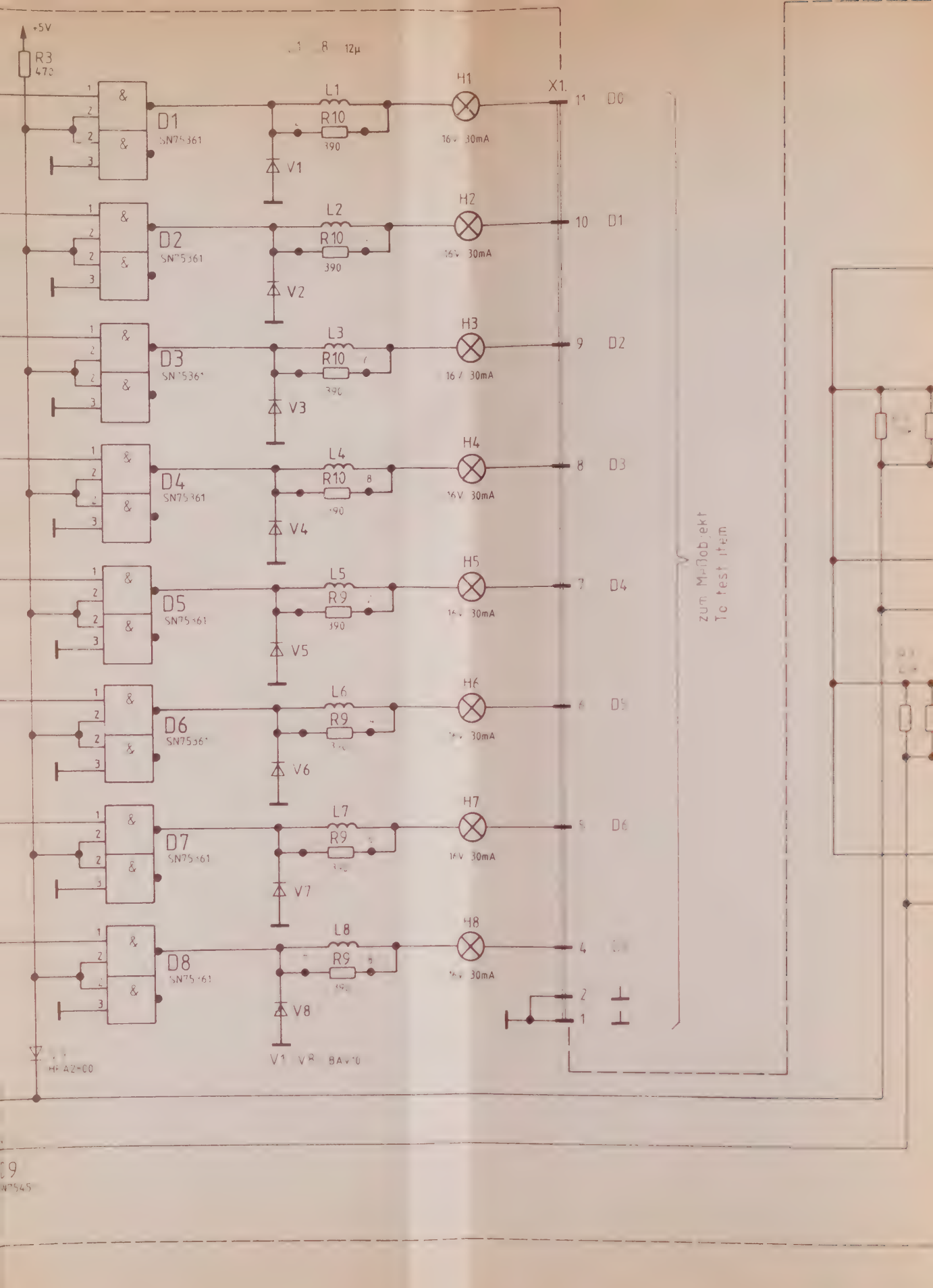
Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
V17	AD BAV10 SI 60V0,6A VALVO BAV10	AD 012.9437	344.3450
V20	AK BSX 26 SI NPN 40V 0,5A SGS BSX26	AK 010.4667	344.3450
BIS V23	AK BSX 26 SI NPN 40V 0,5A SGS BSX26	AK 010.4667	344.3450
W1	DG VERB.KABEL M.MIRKO-D-S BINDER R&S-ZCHNG.344.1028	344.1028	344.3414.01
X1	FP STIFTLEISTE 11 POL BINDER R&S-ZFICHNG.344.0996	344.0996	344.3450
			- ENDE -



C-MOS-Platte
C-MOS board
344.3451

VAR 02 = Grundausführung
Basis model

Stromlauf zu Universal-Datentreiber Universal-data-driver			Zeichn.-Nr. 344.3414.01 S	Blatt-Nr.
IGA-Z1	reg. i. V. 344.3414 V	erste Z		v Bl


+5V
R3
12µ
D1
SN75361
D2
SN75361
D3
SN75361
D4
SN75361
D5
SN75361
D6
SN75361
D7
SN75361
D8
SN75361
L1
L2
L3
L4
L5
L6
L7
L8
R10
390
R9
V1
V2
V3
V4
V5
V6
V7
V8
H1
H2
H3
H4
H5
H6
H7
H8
16V 30mA
X1.
D0
D1
D2
D3
D4
D5
D6
zum Meßobjekt
To test item

Zeichn.-Nr	344 3414 01			Nr	Datum	Name
[illegible]	[illegible]	Name				
gezeichnet	[illegible]	[illegible]				
bearbeitet	[illegible]	WK				
geprüft	11.81	[illegible]				
normgepr.						

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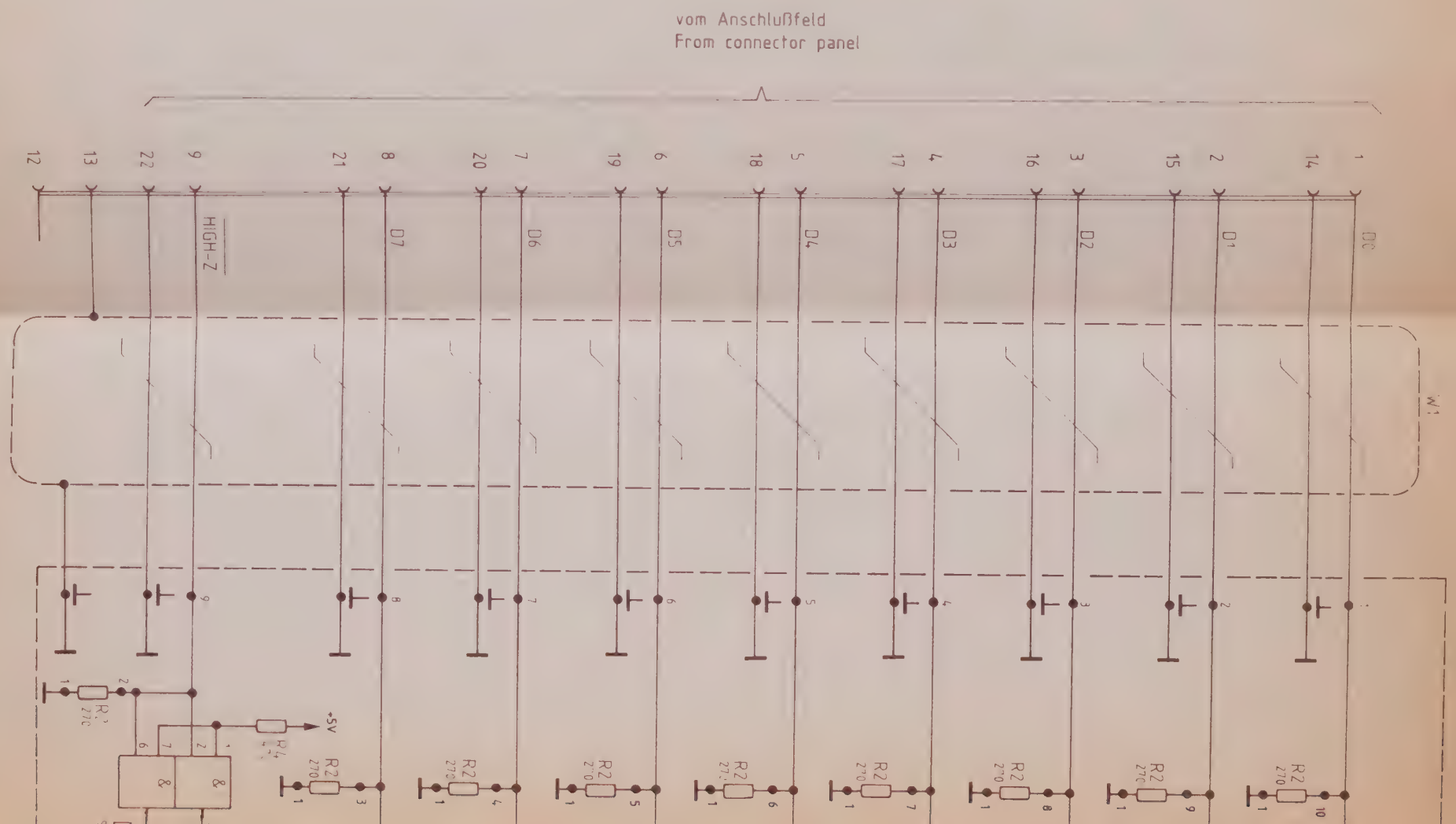
	And Mittlg Nr	Datum	Name	And zust	And Mittlg Nr	Datum	Name



ROHDE&SCHWARZ	AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
	04	0683	ICA-22 UNIV. CLOCK DRIVER	344.3514.01 SA	1

Kennzeichen Component No	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CC 39PF+-2%4X5NP0 CAPACITOR VALVO 2222 678 10399	CC 087.6493	344.3550
BIS/TO C4			
C5	CC 68CPF+-10%4X5%2000 CAPACITOR VALVO 2222 63051 681	CC 087.7019	344.3550
C6	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.3550
C7	CC 330NF+-10% 50V8%1200VI CAPACITOR AEROVOX CKR06BX334KL	CC 082.7740	344.3550
C8	CC 330NF+-10% 50V8%12COVI CAPACITOR AEROVOX CKR06BX334KL	CC 082.7740	344.3550
D1	BO MC33C2P 4/KOMPARATOR IC COMPARATOR MC3302P MOTOROLA MC3302P	BO 233.9744	344.3550
D2	BL SN74S240N 8XINV.BUS-TR BUS-DRIVER TEXAS SN74S240N	BL 344.1386	344.3550
D3	BJ SN75451BP 2X AND DRIV AND DRIVER TEXAS SN75451P	BJ 224.3924	344.3550
D4	BJ SN75361AP 2XTTL/MOS DR TTL/MOS DRIVER NSC DS75361N	BJ 294.8490	344.3550
D5	BJ SN75361AP 2XTTL/MOS DR TTL/MOS DRIVER NSC DS75361N	BJ 294.8490	344.3550
D6	BJ SN75361AP 2XTTL/MOS DR TTL/MOS DRIVER NSC DS75361N	BJ 294.8490	344.3550
H1	EF T1 BI-PIN 16V30MILLIA LAMP MENZEL&SAS MGG1630-E	344.3572	344.3550
BIS/TO H3			
L1	LD 12,0UH 10% 126 MIA CHOKE BELEVIN	LD 092.3282	344.3550
BIS/TO L3			
R1	RL 0,25W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-C	RL 083.1297	344.3550
R2	RL 0,25W 3,92KOHM+-1%TK50 RESISTOR	RL 083.1039	344.3550
R3	RN 4X 10KOHM+-2%SIL 8 H5 ELCEMAN MOD.764-3-10KOHM	RN 291.5154	344.3550

344.3514.01 SA BL 1+

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ROHDE&SCHWARZ	AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
	04	0683	ICA-22 UNIV. CLOCK DRIVER	344.3514.01 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R4	RN 4X 100OHM+-2%SIL 8 H5 RESISTOR NETWORK BOURNS 4308R-102-104	RN 333.9497	344.3550
R5	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R6	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R7	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R8	RL 0,25W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/6810HM-F-C	RL 083.0490	344.3550
R9	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R10	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-C	RL 083.0390	344.3550
R11	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-C	RL 083.0178	344.3550
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-C	RL 083.0390	344.3550
R13	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-C	RL 083.0178	344.3550
R14	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R15	RL 0,25W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	344.3550
R16	RL 0,25W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	344.3550
R17	RL 0,25W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	344.3550
R18	RL 0,25W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	344.3550
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.3550
V2	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	344.3550
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.3550
V4	AE 5082-2800 SCHOTTKYDI DIODE	AE 012.9066	344.3550

344.3514.01 SA BL 2+

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ROHDE&SCHWARZ	ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
	04	0683	1GA-Z2 UNIV. CLOCK DRIVER	344.3514.01 SA	3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	HEWLETT-P. 5082-2800		
V5	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V6	AE 5082-2800 SCHOTTKYDI	AE 012.9066	344.3550
	DIODE		
	HEWLETT-P. 5082-2800		
V7	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V8	AE 5082-2800 SCHOTTKYDI	AE 012.9066	344.3550
	DIODE		
	HEWLETT-P. 5082-2800		
V9	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V10	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V13	AE 5082-2800 SCHOTTKYDI	AE 012.9066	344.3550
	DIODE		
	HEWLETT-P. 5082-2800		
V14	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V15	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V16	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.3550
	DIODE		
	VALVO BAV10		
V17	AK BSX26 NPN 40V 500MA	AK 010.4667	344.3550
	TRANSISTOR		
	SGS BSX26		
W1	DG VERB.KABEL M.MIKRO-D-S	344.1028	
	CABLE		
	BINDER 955-0-70-1002-01-25		
X1	FP STIFTLEISTE 11 POL	344.0996	344.3550
	CONNECTOR		
	BINDER 10-9875-00-11		
			- ENDE -

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Zeichn.-Nr.	4.3514.01		And.-zust.	And. Mittlg. Nr	Datum	Name
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gezeichnet	1.81	JB	B	30643	07.85	WK
bearbeitet	10.81	WK				
geprüft	11.81					
normgepr						

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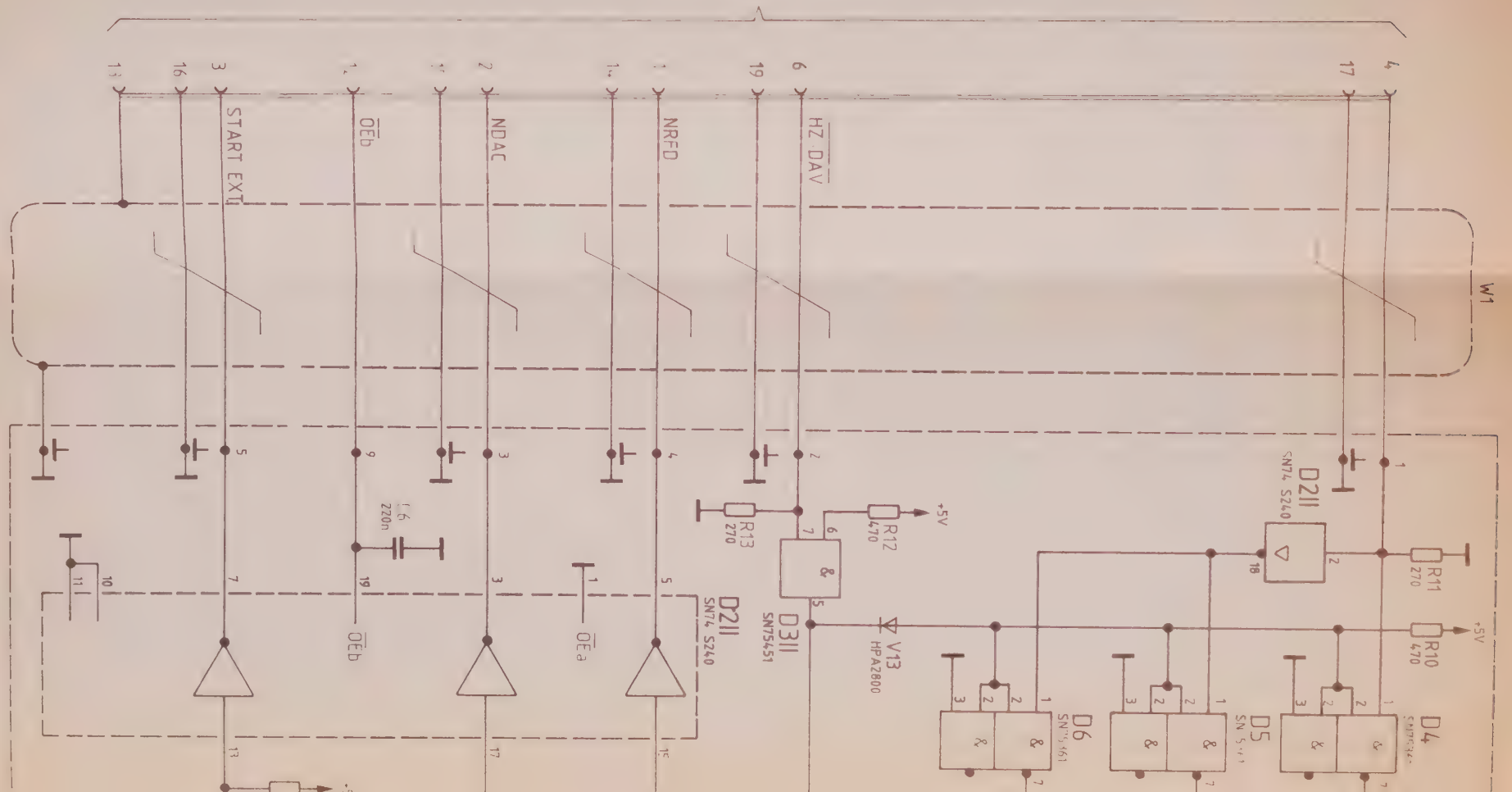
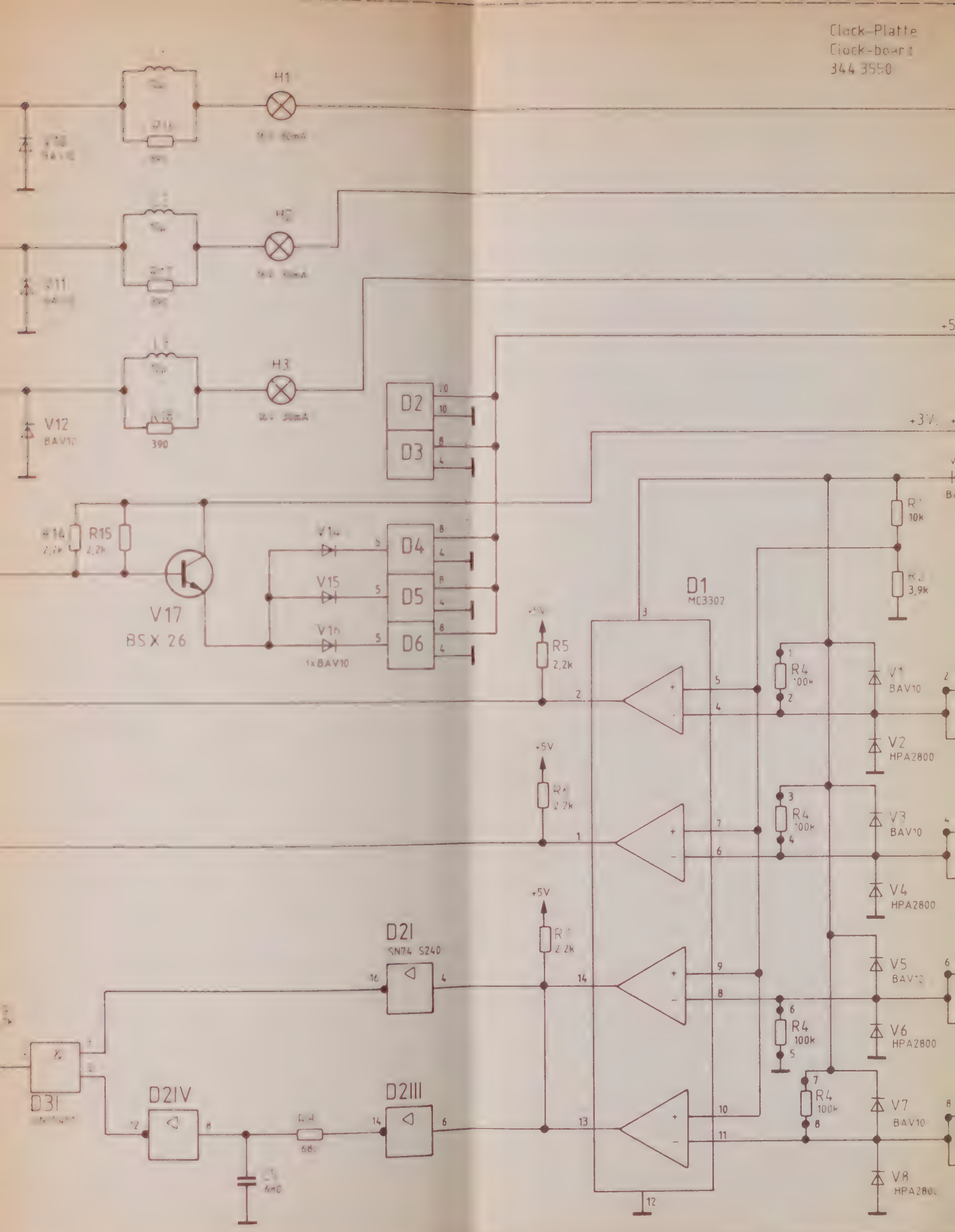
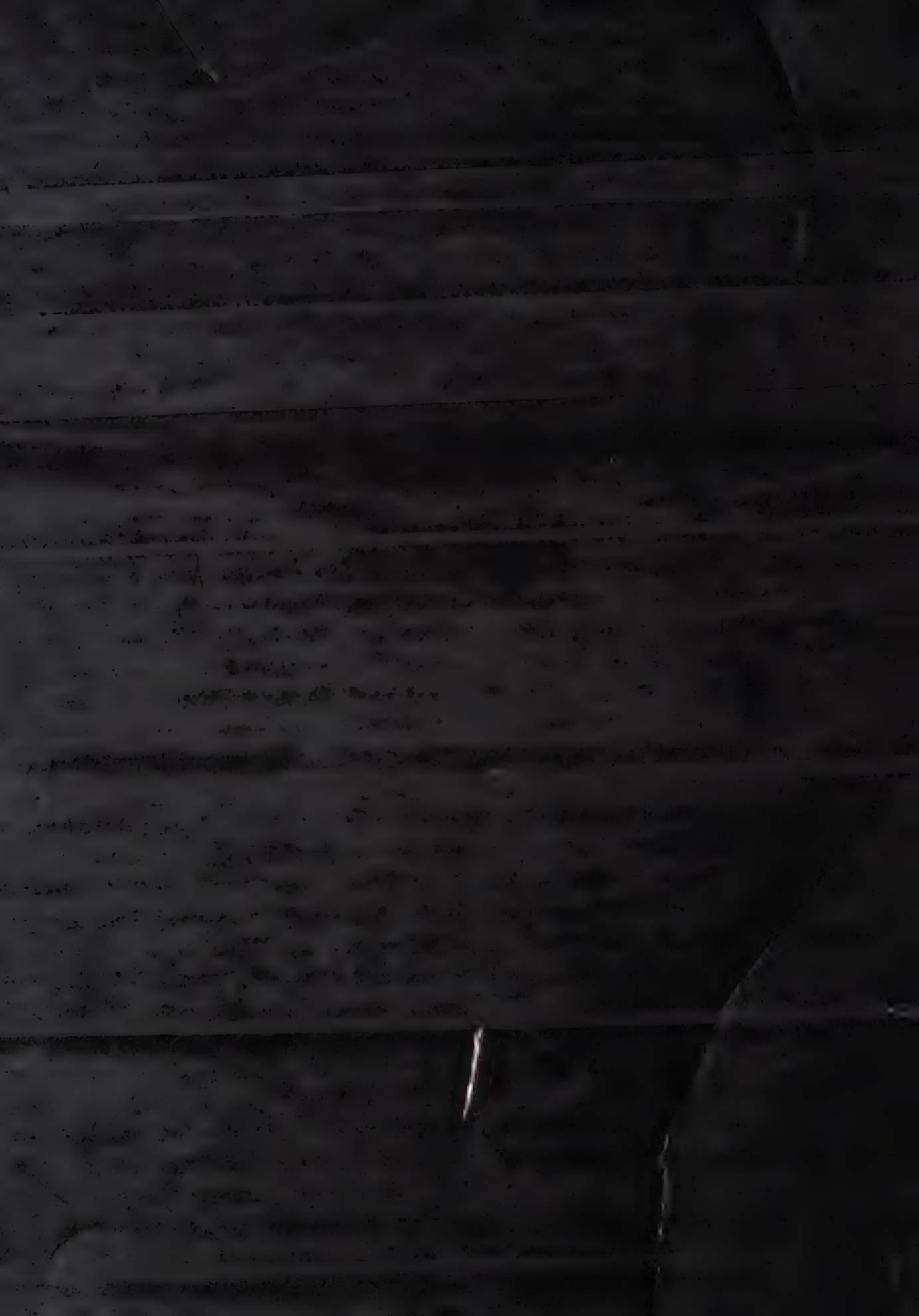
And.-zust	And. Mittlg Nr	Datum	Name	And.-zust.	And. Mittlg Nr.	Datum	Name

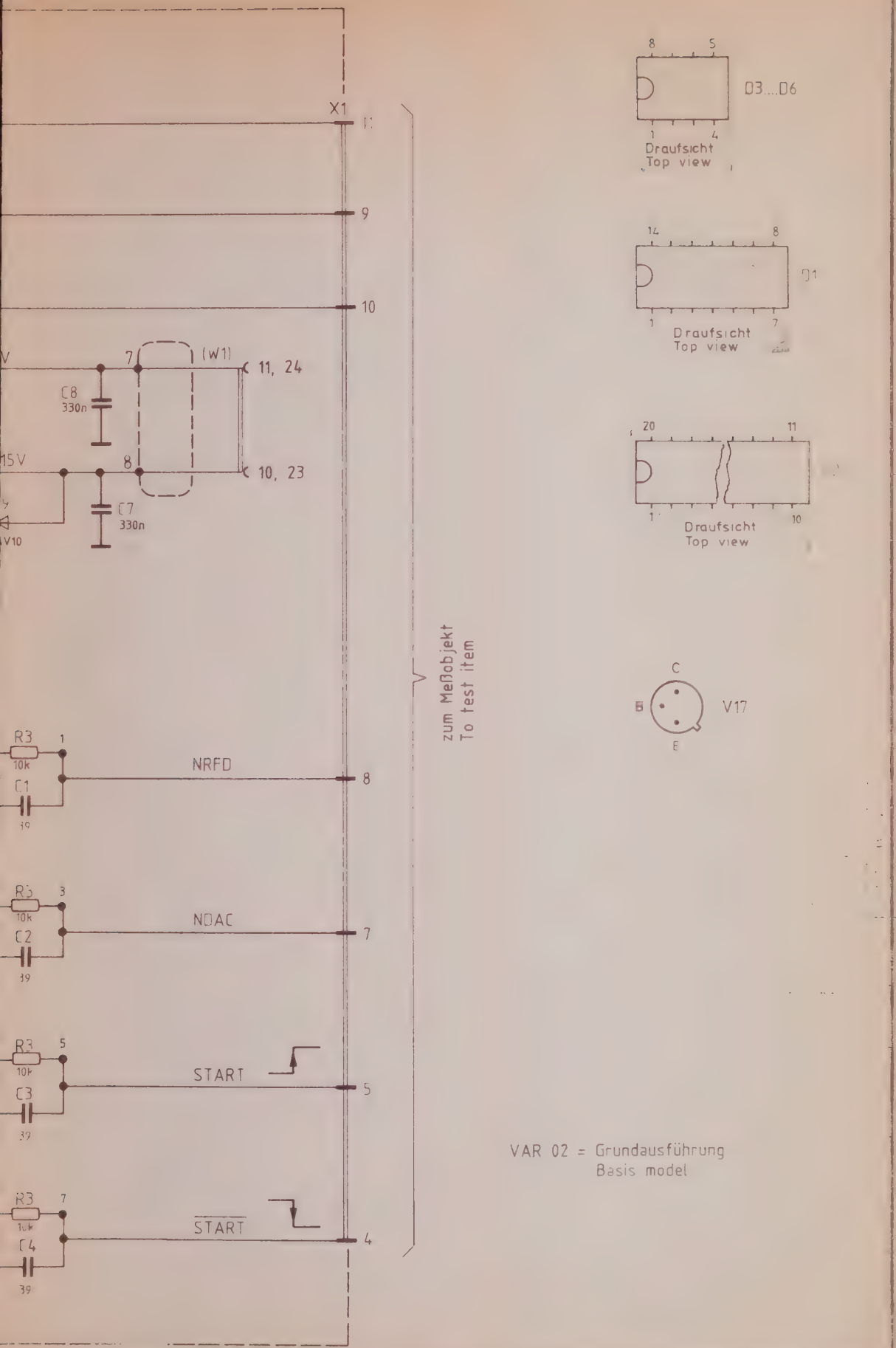
vom Anschlußfeld
From connector panel



Clock-Platte
Clock-board
344 3550







Stromlauf zu Universal-Clock-Treiber Universal-clock-driver		Zeichn.-Nr. 344.3514.01 S	Blatt Nr
IGA-Z2	reg. i V. 344.3514 V	erste Z.	Bl

ROHDE&SCHWARZ	AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
	02	0683	IGA-24-TTL-DATA DRIVER	344.3714.01 SA	1

Kennzeichen Component No	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1157
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
C3	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1157
D1	:: 74F241 / 1KSL/WK	344.7332	344.1157
D2	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
D3	BL SN54368AJ 6XINV-TREIB. IC 6XINV.DRIVER TEXAS SN54368AJ	BL 262.3463	344.1157
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1157
BIS/TO H8			
L1	LD 33,0UH10%3,400HM0,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047	344.1157
BIS/TO L8			
R1	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R2	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R3	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R4	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R5	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R6	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R7	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R8	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-0	RL 083.0178	344.1157
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR	RL 083.0178	344.1157

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ROHDE&SCHWARZ	AZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Page
	02	0683	IGA-24-TTL-DATA DRIVER	344.3714.01 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R10	DRALORIC SMA0207/2740HM-F-0 RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R11	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R12	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R13	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R14	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R15	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R16	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
R17	RL 0,25W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-0	RL 083.0390	344.1157
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1157
V11	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157

095 0026-0481

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DIODE		
	VALVO BAV10		
V12	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157
	DIODE		
	VALVO BAV10		
V13	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157
	DIODE		
	VALVO BAV10		
V14	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157
	DIODE		
	VALVO BAV10		
V15	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157
	DIODE		
	VALVO BAV10		
V16	AD BAV10 60V 0,3 A UDI	AD 012.9437	344.1157
	DIODE		
	VALVO BAV10		
W1	DG VERB.KABEL M.MIRKO-D-S	344.1028	
	CABLE		
	BINDER 955-0-70-1002-01-25		
X1	FP STIFTLEISTE 11 POL	344.0996	344.1157
	CONNECTOR		
	BINDER 10-9875-00-11		
			- ENDE -

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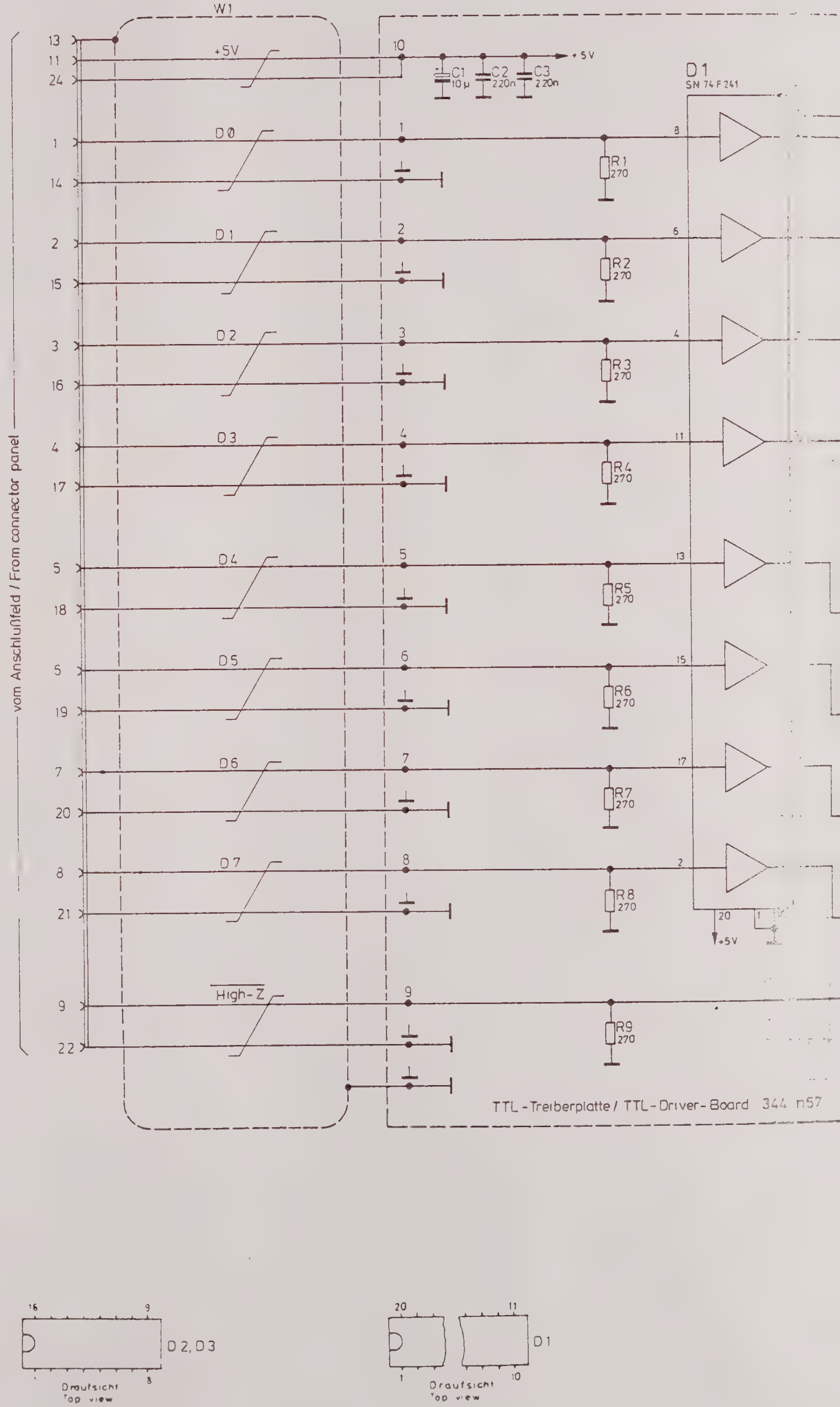
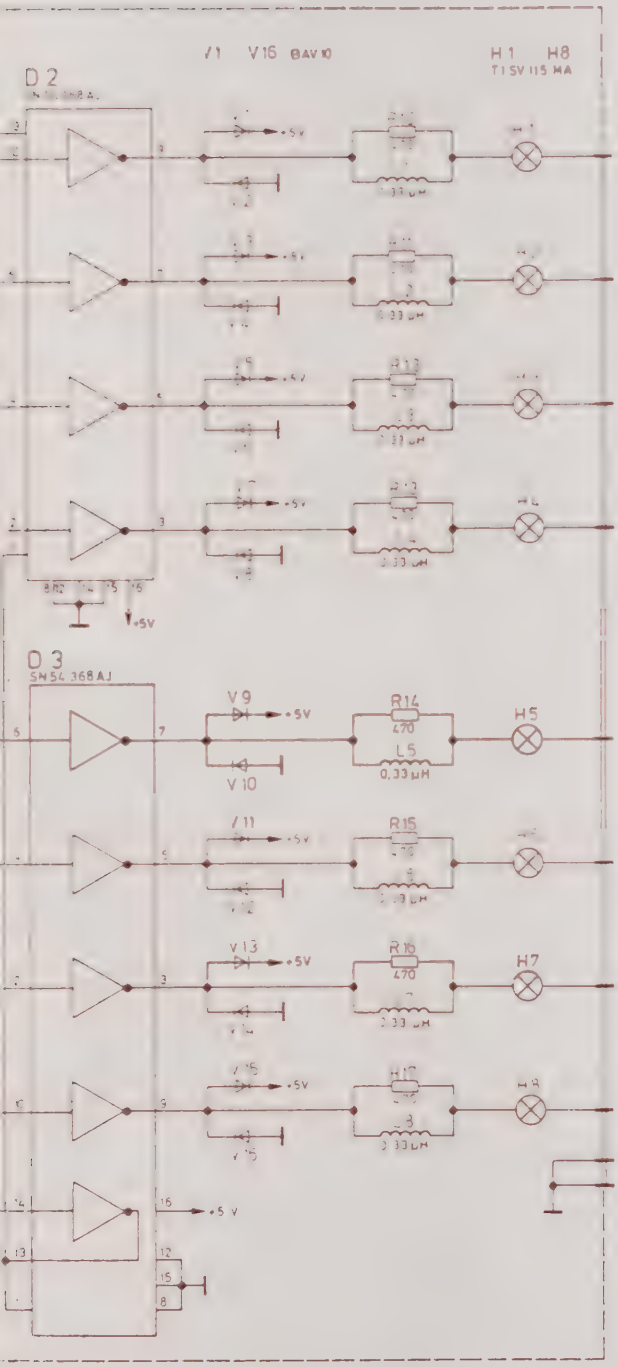


ROHDE & SCHWARZ MÜNCHEN

Zeichn.-Nr. 344.0



— zum Meßobjekt / To test item —

VAR 02 : Grundausführung
Basic model

Stromlauf zu

TTL - Datentreiber IGA - Z4
TTL - Data - Driver

Z

Zeichn. Nr. 344.3714.01 S

344.3714 V

ROHDE&SCHWARZ	ÄZ	Datum Date	Schaltteilliste für Parts list for IGA-Z5 TTL-CLOCK DRIVER	Sachnummer Stock No	Blatt Page
	02	0683		344.3814.01 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C1	CE 10 UF-10+50% 40V 6X17 ELECTROLYTIC CAPACITOR ROEDERST EBS 10/40 6X17	CE 092.4466	344.1170
C2	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR AEROVOX CKR06BX224KL	CC 084.5515	344.1170
C3	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.1170
C4	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	344.1170
C5	CC 56PF+-2%4X5N750 CAPACITOR VALVO 2222 678 58569 NICHT BESTUECKT/NOT IN	CC 087.6870	344.1170
D1	:: 74F241 / 1KSL/WK	344.7332	344.1170
D2	BL SN54S00J 4/2INP.NAND IC NAND GATE SN54S00J TEXAS SN54S00J	BL 468.5899	344.1170
D3	BL HEF4049BP 6X INVERT INVERTER VALVO HEF4049BP	BL 347.3350	344.1170
D4	:: 74F241 / 1KSL/WK	344.7332	344.1170
H1	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H2	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H3	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H4	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H5	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H6	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
H7	EF T1 SV 115MA M.STIFTEN LAMP MGG MGG 1150-8	344.0796	344.1170
L1	LD 0,82UH10%0,850HM0,420A CHOKE DELEVAN DROSSEL1025-18	LD 067.2857	344.1170
L2	LD 0,82UH10%0,850HM0,420A CHOKE DELEVAN DROSSEL1025-18	LD 067.2857	344.1170
L3	LD 0,82UH10%0,850HM0,420A CHOKE	LD 067.2857	344.1170

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ROHDE&SCHWARZ	ÄZ	Datum Date	Schaltteilliste für Parts list for IGA-Z5 TTL-CLOCK DRIVER	Sachnummer Stock No.	Blatt Page
	02	0683		344.3814.01 SA	2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
	DELEVAN DROSSEL1025-18		
R1	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R2	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R3	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R4	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R7	RL 0,25W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	344.1170
R8	RL 0,25W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	344.1170
R9	RL 0,25W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2740HM-F-D	RL 083.0178	344.1170
R10	RF 0-WIDERSTAND DIN 0207 0-RESISTOR RESISTA SK2,0 OHM	RF 069.0000	344.1170
R11	RL 0,25W 3,01KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,01K-F-D	RL 083.0961	344.1170
R12	RL 0,25W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283	344.1170
R13	RL 0,25W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	344.1170
R15	RL 0,25W 121KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/121K-F-C	RL 083.2070	344.1170
R16	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F+D	RL 082.9636	344.1170
R17	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F+D	RL 082.9636	344.1170
R18	RL 0,25W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F+D	RL 082.9636	344.1170
V1	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V2	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V3	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V4	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V5	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V6	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V7	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V8	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V9	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V10	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V11	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V12	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V13	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
V14	AD BAV10 60V 0,3 A UDI DIODE VALVO BAV10	AD 012.9437	344.1170
W1	DG VERB.KABEL M.MIRKO-D-S CABLE BINDER 955-0-70-1002-01-25	344.1028	
X1	FP STIFTLEISTE 11 POL CONNECTOR BINDER 10-9875-00-11	344.0996	344.1170
			- ENDE -

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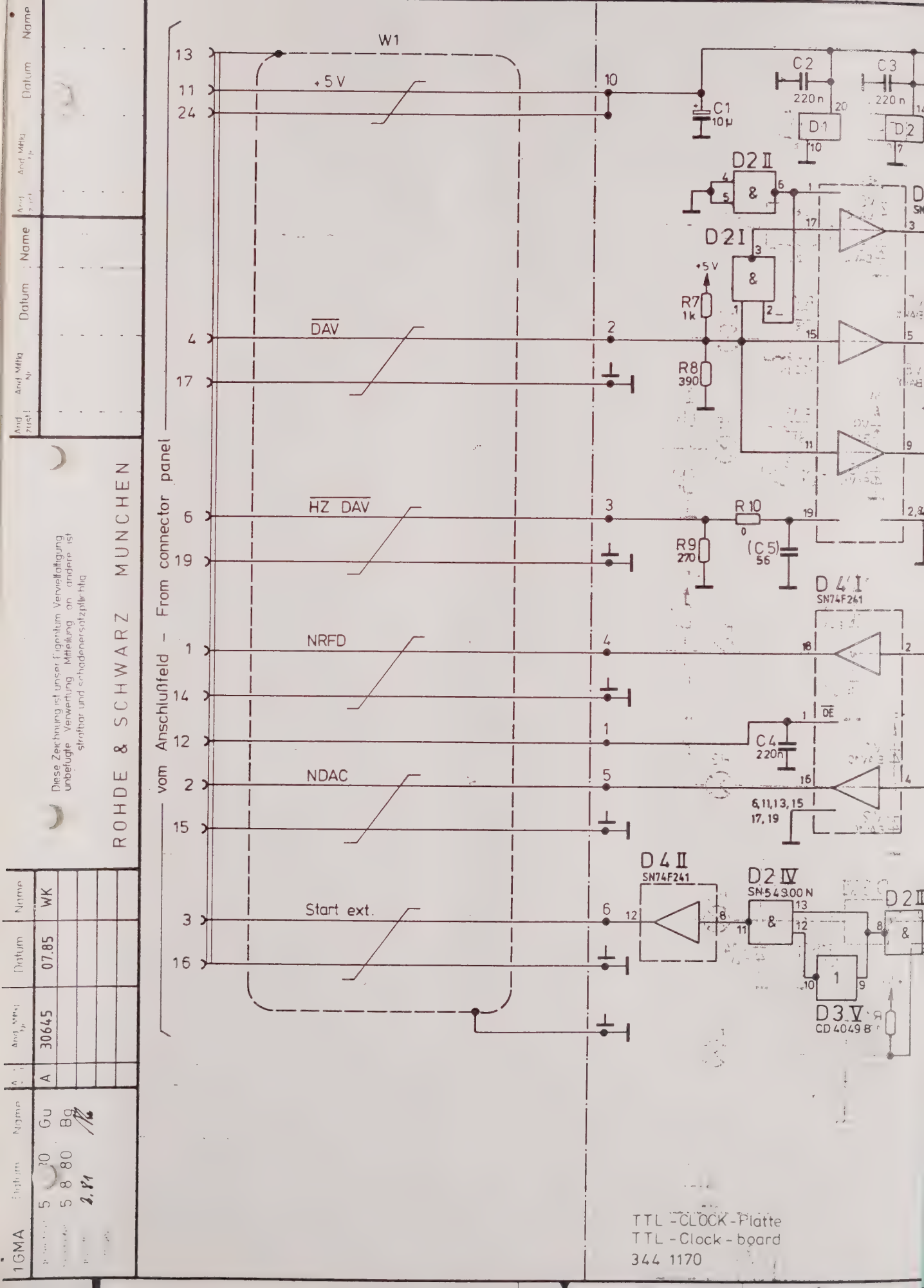
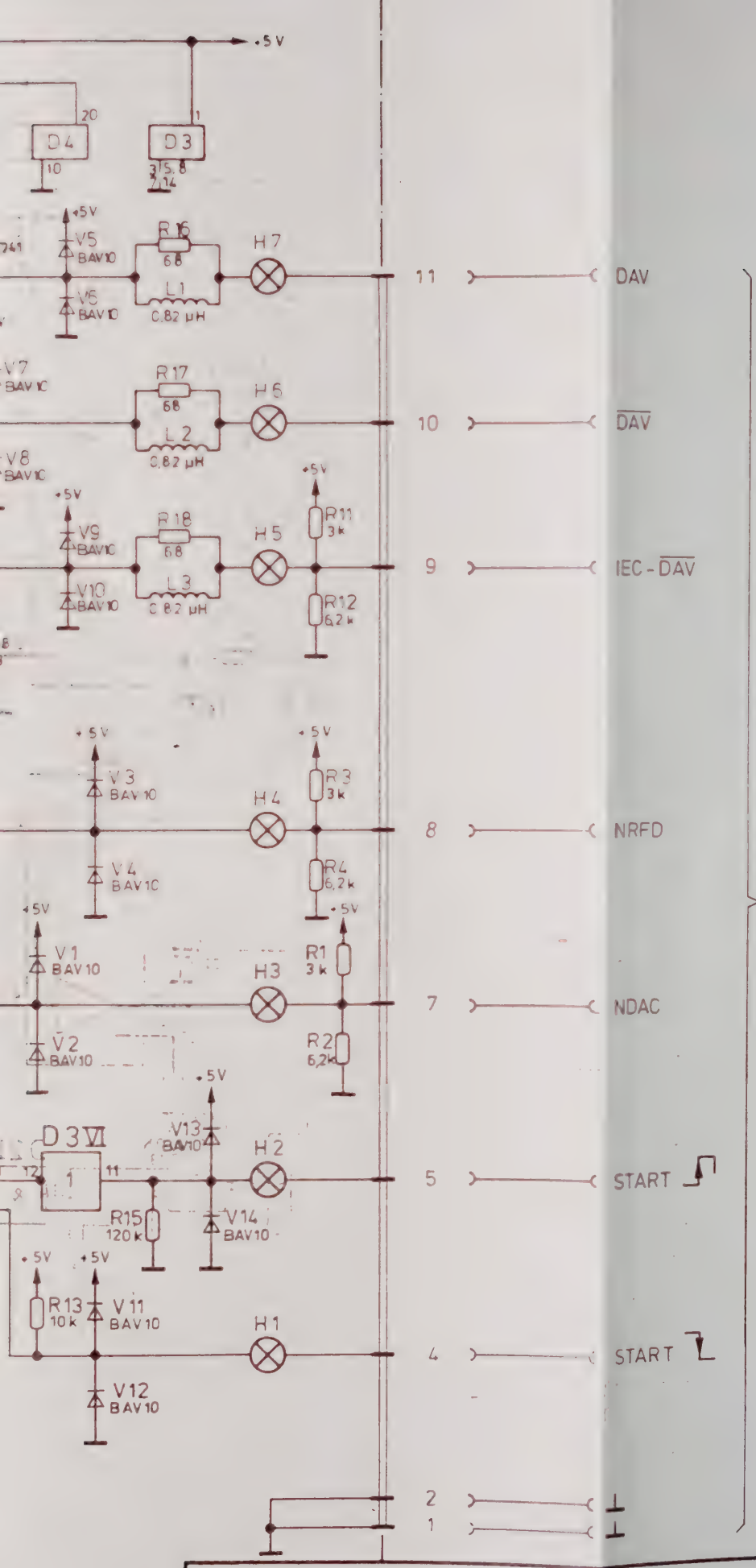
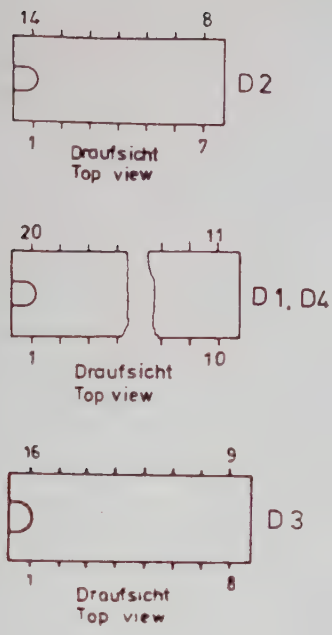


W1
+5V
DAV
HZ DAV
NRFD
NDAC
Start ext.
vom Anschlußfeld - From connector panel
C1 10µ
C2 220n
C3 220n
D1
D2
D2 II
D2 I
R7 1k
R8 390
R9 270
R10 0
(C5) 56
D4 I SN74F241
C4 220n
OE
6,11,13,15 17,19
D4 II SN74F241
D2 IV SN5493 00 N
D3 V CD4049 B
TTL -CLOCK-Platte
TTL -Clock-board
344 1170
ROHDE & SCHWARZ MUNCHEN
Diese Zeichnung ist unser Eigentum Vervielfältigung unbefugte Verwertung Mitteilung an andere ist strafbar und schadenersatzpflichtig
1GMA
A 30645 07.85 WK
5 8 80 Bg
2.81



zum Meßobjekt
To test item



VAR 02 : Grundausführung
Basic model

Stromlauf ZL

TTL-Clocktreiber IGA-Z5
TTL-Clock-Driver

Z

Zeichn Nr 344.3814.01 S

reg i V 344.3814V

erste Z

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ROHDE & SCHWARZ

And. zust	And Mittlg Nr	Datum	Name
A	30646	06.8..	WK

Zeichn.-Nr.	Datum	Name
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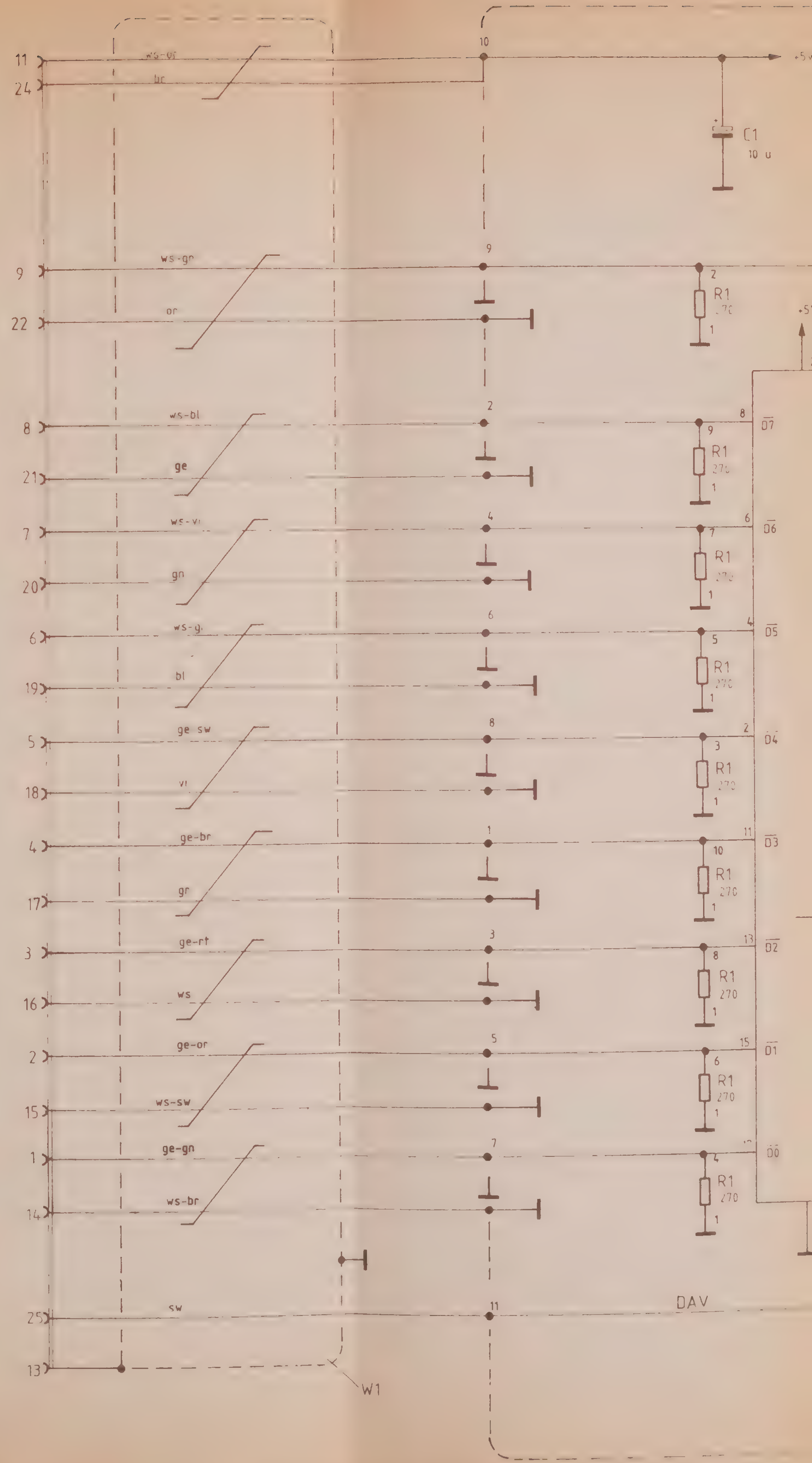
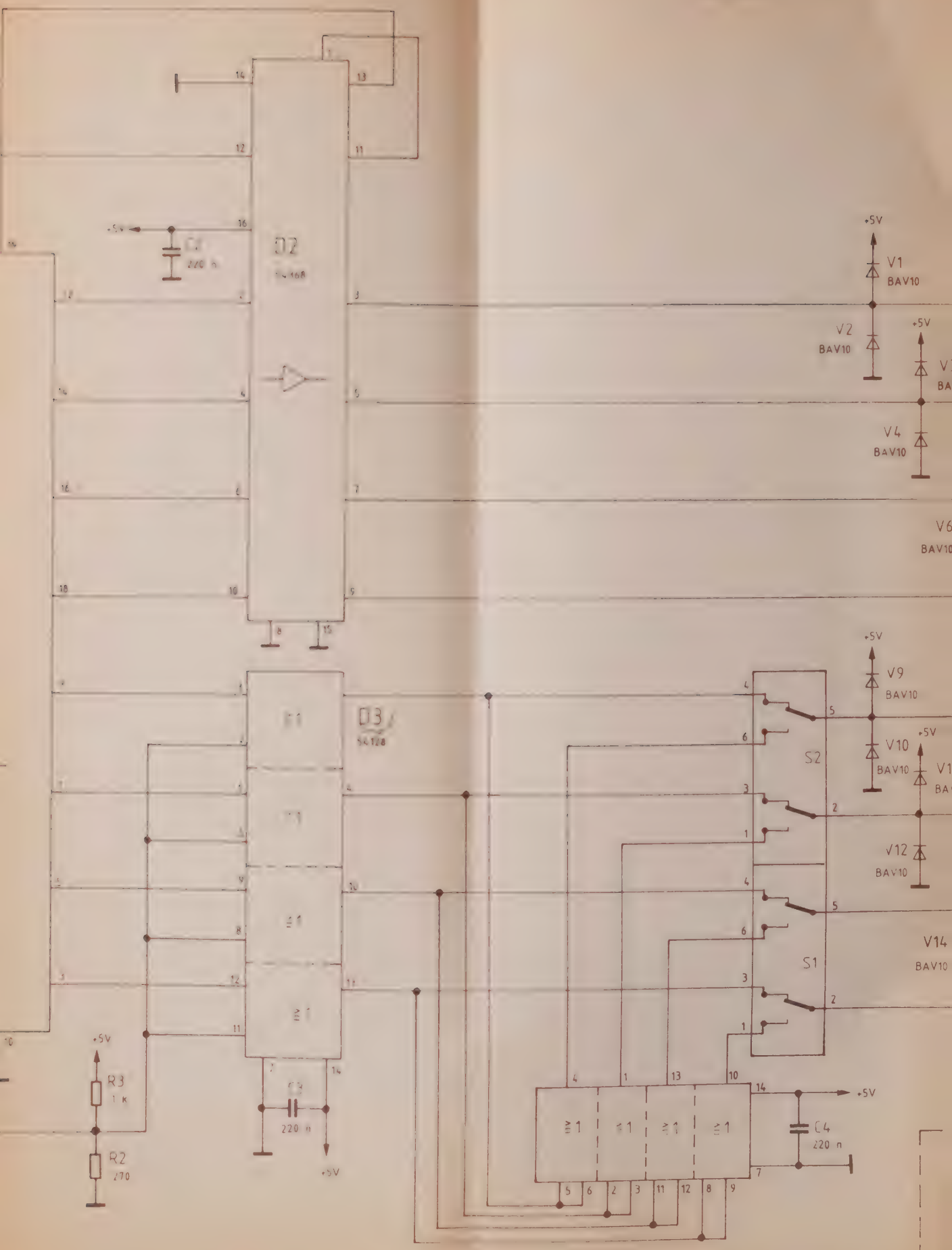
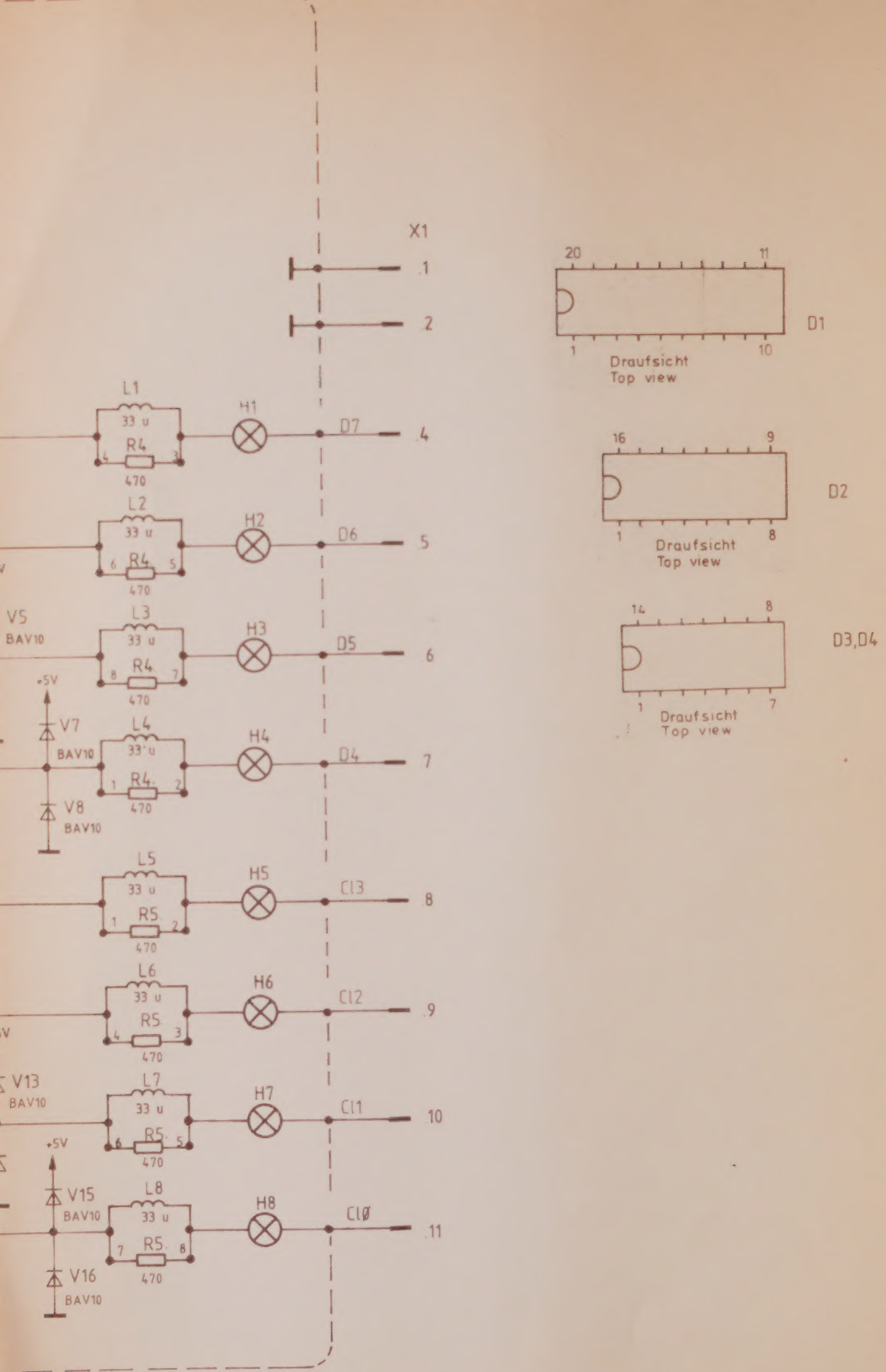
gezeichnet	14.4.1981	Hg
bearbeitet	4.81	
geprüft	15.5.81	
normgepr		



TTL MULTICLOCK-BOARD

344 3950





Stromlauf zu TTL MULTICLOCK DRIVER Z			Zeichn.-Nr. 344.3914 S	Blatt-Nr.
IGA-Z6	reg. i. V. 344.3914	erste Z. ———		v. Bl.